REPORT RESUMES

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ELECTRONIC BUSINESS DATA PROCESSING PERIPHERAL EQUIPMENT OCCUPATIONS, SUGGESTED CURRICULA.
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VOCATIONAL CURRICULUMS ARE SUGGESTED FOR EIGHT ELECTRONIC BUSINESS DATA PROCESSING OCCUPATIONS AS A GUIDE TO TRAINING UNEMPLOYED AND UNDEREMPLOYED PERSONS. THE COURSE OUTLINES AND OTHER MATERIAL WERE PREPARED BY STAFF MEMBERS OF THE INFORMATION AND TRAINING SERVICES DIVISION OF MCGRAW-HILL, INC. CONSULTANTS INCLUDED DATA PROCESSING TRAINING SPECIALISTS FROM INDUSTRY, ADMINISTRATORS IN CITY AND STATE BUSINESS EDUCATION DEPARTMENTS, AND FACULTY MEMEBERS IN HIGH SCHOOLS, COLLEGES, AND VOCATIONAL TRAINING INSTITUTIONS. CURRICULUMS ARE SUGGESTED FOR THE OCCUPATIONS--(1) TAPE LIBRARIAN, (2) KEY-PUNCH OPERATOR, (3) CLERICAL SUPERVISOR, (4) CODING CLERK, (5) MACHINE-RECORDS UNIT SUPERVISOR, (6) STATISTICAL CLERK, (7) TABULATING MACHINE OPERATOR, AND (8) CONSOLE OPERATOR. SUBJECTS FOR EACH OCCUPATIONAL COURSE OF STUDY ARE DRAWN FROM GENERAL OFFICE EDUCATION UNITS, SUBJECTS COMMON TO TWO OR MORE OCCUPATIONS, AND SPECIALIZED OCCUPATION UNITS, BOTH LISTED. PROGRAM LENGTHS VARY FROM 13 TO TWENTY-TWO 30-HOUR WEEKS. HOURS REQUIRED, UNIT DESCRIPTION, TOPIC OUTLINES FOR EACH UNIT, TEXTS, AND OTHER TEACHING AIDS ARE SHOWN FOR EACH COURSE OF STUDY. JOB DESCRIPTIONS AND PREREQUISITES FOR TRAINING AND EMPLOYMENT ARE GIVEN FOR EACH OCCUPATION. TRAINEES ENROLLED IN THE PROGRAMS ARE EXPECTED TO HAVE COMPLETED APPROXIMATELY 10 YEARS OF FORMAL EDUCATION AND TO HAVE A WORKING KNOWLEDGE OF ENGLISH AND ELEMENTARY ARITHMETIC. INSTRUCTORS SHOULD BE QUALIFIED IN BUSINESS DATA PROCESSING. SUGGESTED STANDARDS OF ACHIEVEMENT AND AN EXTENSIVE BIBLIOGRAPHY OF TEXTS AND REFERENCES, PERIODICALS, DIRECTORIES, FILMS AND FILMSTRIPS, AND OTHER INSTRUCTIONAL AIDS ARE INCLUDED. THIS DOCUMENT IS AVAILABLE FOR 70 CENTS FROM SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402. (PS)

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MANPOWER DEVELOPMENT AND TRAINING PROGRAM

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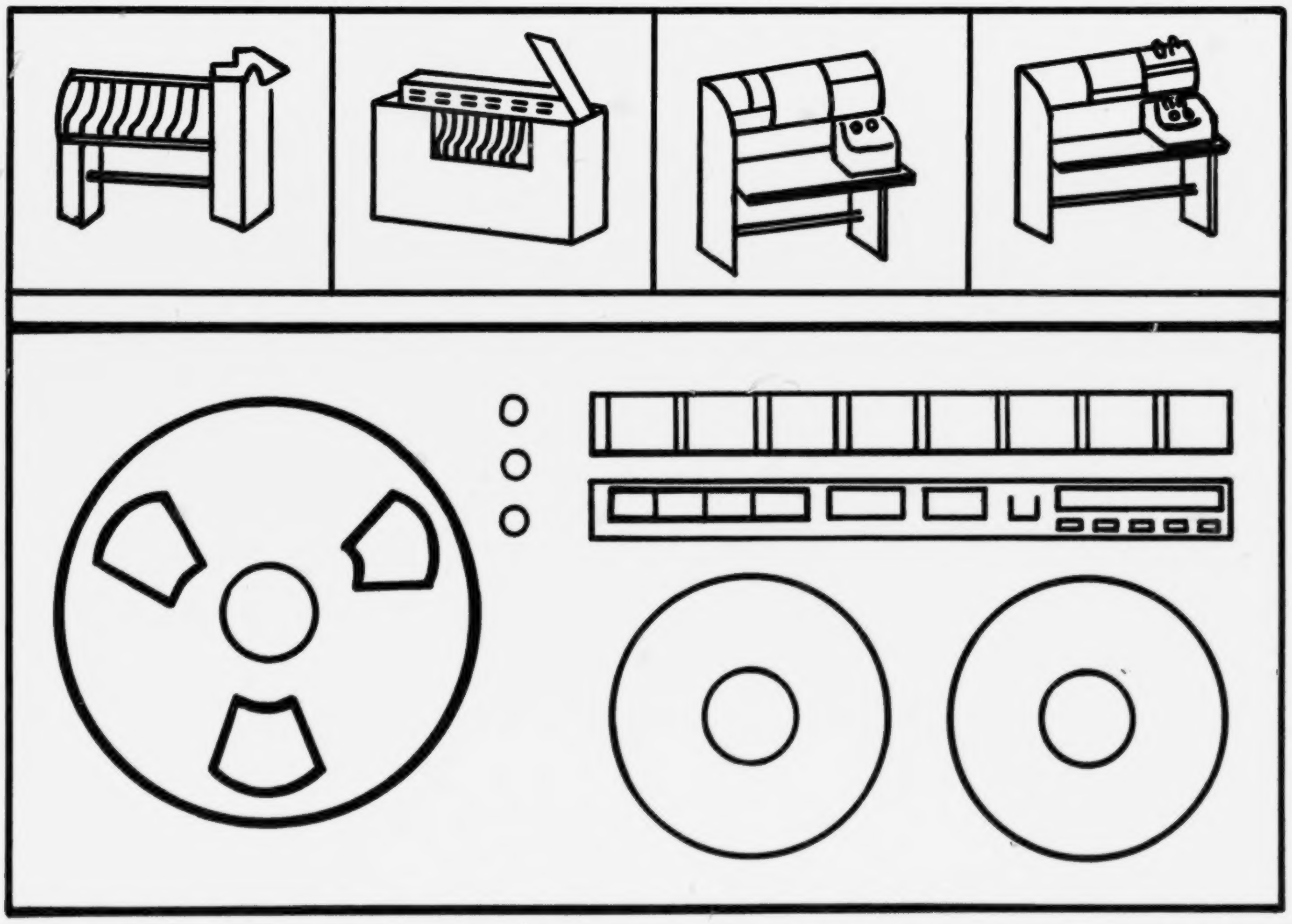
ELECTRONIC BUSINESS DATA PROCESSING PERIPHERAL EQUIPMENT OCCUPATIONS

suggested curricula



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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

OE-86010

MANPOWER DEVELOPMENT AND TRAINING PROGRAM

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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ELECTRONIC BUSINESS DATA PROCESSING PERIPHERAL EQUIPMENT OCCUPATIONS

Suggested Curricula

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education • Division of Vocational and Technical Education

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FOREWORD

THE MANPOWER DEVELOPMENT AND TRAINING ACT OF 1962 established a large-scale training effort to solve the problem of hard-core unemployment. The nationwide program of vocational training proposes to provide marketable job skills for unemployed and underemployed persons, including industrial and business workers whose skills have been rendered obsolete by automation, farm workers no longer needed in an era of mechanized agriculture, and youths who left school without acquiring a marketable job skill. The Nation needs to reduce the number of people dependent on unemployment compensation or public welfare and to increase its reservoir of skilled manpower. The Manpower Development and Training Act of 1962 was designed to meet these objectives.

Training programs are administered by the State Boards for Vocational Education under an agreement with the Secretary of the Department of Health, Education, and Welfare. Applicants for training are screened and referred to the schools by the State Employment Service offices which are affiliated with the United States Employment Service.

The training courses to be offered in any particular community or State are determined by surveys made by the State Employment Service of the job offerings in that locality, and with approval of the teaching content by the State Department of Education. A prime objective of the program is to be reasonably certain that each trainee will be readily absorbed into the labor force when his course is completed. In many areas there are chronic shortages of such workers as key punch operators and computer console operators. Trainees with skills in data processing, peripheral equipment operation, and allied occupations greatly improve their chances for gainful employment.

This publication has been prepared to suggest vocational curricula in certain electronic business data processing occupations. The outlines and other materials are designed to aid administrators, supervisors, and teachers in the promotion and development of these vocational courses. It should be recognized that the material contained herein is for "suggested" curricula, which should, in most instances, be adapted to meet local needs and training facilities.

The course outlines and other materials were prepared by staff members of the Information and Training Services Division of McGraw-Hill, Inc., under a contractual arrangement with the U. S. Office of Education. Consultants to McGraw-Hill included data processing training specialists from industry; administrators in city and State business education departments; and faculty members in high school, college, and university business education departments and vocational training institutions. All the materials were discussed and reviewed by the consultants, by the McGraw-Hill staff, and by the U. S. Office of Education. Many varied suggestions and criticisms were received. The curricula necessarily could not reflect all the suggested approaches, philosophies, and ideas, but each one was carefully considered and, wherever possible, was incorporated into the final document. Since the resulting materials represent many opinions, no approval or endorsement by any one institution, agency, or person should be inferred.

WALTER M. ARNOLD
Assistant Commissioner for
Vocational and Technical Education

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ELECTRONIC BUSINESS DATA PROCESSING PERIPHERAL EQUIPMENT OCCUPATIONS

INTRODUCTION

TECHNOLOGICAL AND ECONOMIC DEVELOPMENTS mean changing manpower needs in the United States in the coming years. Expanded training efforts are required to assure that the rapidly growing work force will be trained to meet shifting needs.

To be fully effective, training programs require surveys of manpower resources, community skill requirement studies, training program development, aptitude testing, counseling, trainee selection, referral to training programs, job development, referral to jobs, and follow-up. Training must be directed toward specific employment needs in the area where job openings exist.

One expanding area of employment is the cluster of jobs centered around electronic business data processing. In order to handle the growing volume of business data which must be processed, skilled people are required to operate data processing equipment.

These suggested curricula provide a guide to training unemployed and underemployed persons as qualified workers in several business data processing occupations.

It is envisioned that technical changes in data processing equipment and systems will necessitate periodic review of suggested curricula with a view to deleting units, changing or adding subject content, and even eliminating certain occupations because of technological change.

The "About the Curricula" section of this guide contains information about the design and objectives of the program. Also included are suggestions for making use of the unit outlines and programs for administrative and teaching purposes. Some of these suggestions will be found under "Administrative Options."

The design of the curricula is sufficiently flexible to give local administrators and instructors wide latitude in planning and conducting courses which meet the needs of selected trainees. Local facilities and training needs will, to a large extent, determine how the suggested plans discussed in "About the Curricula" are to be adapted for use in particular programs for effective utilization of instruction time, reduction of schedule planning time, and optimum use of available training facilities.

Appendix A provides suggestions for evaluating trainee achievement. Achievement is matched with selected occupational competencies. Job descriptions from the revised edition of the Dictionary of Occupational Titles and suggested position and training prerequisites are provided for each of eight data processing occupations.

Each subject unit includes a list of suggested texts, references, and other teaching aids. Additional teaching materials that may be helpful to the teacher are listed in Appendix B. These lists include the more commonly used materials in the subject fields. As with the specific course content, the choice of teaching materials rests with local school administrators and instructors. Local business firms may provide additional useful teaching materials and resource persons.

The Sample Suggested Lesson Plan in Appendix B is included to assist the instructors in the preparation of guides for individual lessons. It is not intended as an example to be rigidly followed, but is offered as an illustration of one way to develop an outline topic.

Qualified business data processing instructors may be found in commercial and Government data processing installations, in vocational training schools, and in colleges, universities, and secondary schools.

The basic program goals are the accelerated development of skills used in specific business data processing occupations and the increase in trainee understanding of basic concepts and fundamental principles applicable to business and data processing. In view of the training goals, the teacher should provide useful and rewarding equipment operation experiences for the trainee throughout the program.

CURRICULA OUTLINES

General Office Education Units

Unit Title	Code	Hours
Business Mathematics I	BM-I	30
Business Mathematics II	BM-II	30
Elements of Fiscal Recordkeeping	FA	60
Payroll Records	PR	30
Language Skills	LS	30
Business Communications	BC	30
Personal Development	PD	30
Business Principles and Organization I	BPO-I	30
Business Principles and Organization II	BPO-II	30
Fundamentals of Typing	FT	60
Production Typing	PT	60
Office Calculators	OC	30
Introduction to Business Data Processing	BDP	60
Electro-Mechanical Accounting Machines	EAM	30
Elementary Descriptive Statistics	EDS	60
Principles of Supervision	OS	30
Psychology for Supervisors	PS	30
Classification and Coding	CLC	60
Introduction to Computers	IC	30

Specialized Occupation Units

Elementary Library Systems	ELS	60
Key-Punch Equipment Operation	KP	60
Data Processing Mathematics	DPM	30
Introduction to Programming	IP	30
Tabulating Machine Operation	TM	45
Tabulating Machine Wiring	TMW	45
Control Console Operation	CO	60
Data Processing Systems	DPS	90

CURRICULA SYNOPSES

Each peripheral business data processing occupational training program is shown below with its suggested length in weeks. A week consists of 5 6-hour days totaling 30 hours. Variations in the length of the training day may be made on the basis of trainee caliber and administrative judgment.

Occupation	Length of Program in Weeks
Tape Librarian	13
Key-Punch Operator	15
Supervisor, Clerical	22
Coding Clerk	13
Supervisor, Machine-Records Unit	22
Statistical Clerk	15
Tabulating Machine Operator	15
Console Operator	15

Daily Training Schedules

Since many of the occupational training programs have identical subject units for certain periods of time, trainees may be grouped in order to conserve teaching time, space, and facilities. Suggested daily training schedules are shown in the following tables. The tables show the hours of the day, the subject unit suggested for each hour, and the occupations for which the scheduling is appropriate. The codes used for subject units are to be found in the Curricula Outlines section.

First Period—6 weeks

Occupational Training Group	Suggested subject unit, by hour of the training day					
	1	2	3	4	5	6
Tape Librarian	BDP	BDP	PD	BPO-I	FT	FT
Key-Punch Operator	BDP	BDP	PD	BPO-I	FT	FT
Clerical Supervisor	BDP	BDP	PD	BPO-I	OS	BM-I
Coding Clerk	BDP	BDP	LS	BPO-I	PD	BM-I
Machine Records Unit Supervisor	BDP	BDP	PD	BPO-I	OS	BM-I
Statistical Clerk	BDP	BDP	LS	BPO-I	PD	BM-I
Tabulating Machine Operator	BDP	BDP	LS	BPO-I	PD	BM-I
Console Operator	BDP	BDP	LS	BPO-I	PD	BM-I

Second Period—6 weeks

Occupational Training Group	Suggested subject unit, by hour of the training day					
	1	2	3	4	5	6
Tape Librarian	PT	PT	LS	BC	ELS	ELS
Key-Punch Operator	PT	PT	LS	BC	BPO-II	OC
Clerical Supervisor	BM-II	FA	FA	BC	FT	FT
Coding Clerk	BM-II	FA	FA	CLC	CLC	IC
Machine Records Unit Supervisor	BM-II	FA	FA	BC	BPO-II	IC
Statistical Clerk	BM-II	FA	FA	PR	BPO-II	OC
Tabulating Machine Operator	BM-II	FA	FA	PR	BPO-II	OC
Console Operator	BM-II	FA	FA	BC	BPO-II	IC

Third Period—1 week

During the third period, lasting one week, all occupational training groups will be given the subject, Electro-Mechanical Accounting Machines. Tape Librarian and Coding Clerk groups will have completed their programs of study at the end of the third period.

Fourth Period—2 to 6 Weeks

Occupational Training Group	Period Length (weeks)	Suggested subject unit, by hour of the training day					
		1	2	3	4	5	6
Key-Punch Operator	2	KP	KP	KP	KP	KP	KP
Statistical Clerk	2	EDS	EDS	EDS	EDS	EDS	EDS
Tabulating Machine Operator	2	TM	TM	TM	TMW	TMW	TMW
Console Operator	2	CO	CO	CO	CO	CO	CO
Clerical Supervisor	6	PT	PT	PS	PR	BPO-II	IC
Machine Records Unit Supervisor	6	IP	DPM	PS	DPS	DPS	DPS

Fifth Period—2 Weeks

Occupational Training Group	Suggested subject unit, by hour of the training day					
	1	2	3	4	5	6
Clerical Supervisor	OC	CLC	CLC	EDS	EDS	EDS
Machine Records Unit Supervisor	OC	CLC	CLC	EDS	EDS	EDS

ABOUT THE CURRICULA

These suggested curricula differ from those offered in most educational institutions in that major emphasis is placed upon skill and knowledge development for specific peripheral business data processing occupations described in the revised edition of the Dictionary of Occupational Titles.

The curricula objectives provide a framework of suggested studies qualifying trainees to hold certain jobs in the business data processing field. The suggested framework is sufficiently flexible to permit adaptation of the program at local levels according to community needs and availability of facilities, equipment, and teaching time.

The course of study for each of the eight occupations has been planned to provide the specific skills needed for employment, and to give each trainee a background in general office work. Subjects for each occupational course of study are drawn from two groupings—General Office Education Units and Specialized Occupation Units. The General Office Education Units section is comprised of those subjects common to two or more occupations. The subject content of these units will serve to orient the trainee to office work and provide certain prerequisite skills for particular occupational studies. They can also be used to refresh the trainee with information or skills previously acquired but forgotten through disuse.

Several of the General Office Education Units were included in Clerical and Record Keeping Occupations and Stenographic-Secretarial Occupations, two suggested curricula previously developed by the U. S. Office of Education under the Manpower Development and Training Act. The subject units were reviewed and changed to fit the needs of the Electronic Business Data Processing Peripheral Equipment Occupations. Suggested curricula changes reflect a desire to accelerate the training time.

The Specialized Occupation Unit outlines, texts and other teaching aids are germane to the specific occupation under which they are grouped. Job descriptions and prerequisites for training and employment are shown for each occupation. To the extent possible, the subject content of the Specialized Occupation Units has been generalized to allow adaptation by the teachers to suit the business data processing equipment available at the training location.

The subjects suggested for each occupational program were developed to correspond to job descriptions detailed in the revised edition of the Dictionary of Occupational Titles. Since these job descriptions are general in nature, having been compiled from many sources in different locations, it is envisioned that programs may have to be adjusted to local conditions.

Since some of the special occupational skills learned in the program will become obsolete, programs are sufficiently broad to permit adaptation to changes of data processing equipment and the demand for certain job skills. Each program is planned to strike a balance between general knowledge and acquisition of skills. Skill in operating equipment is a necessity for obtaining employment. An understanding of fundamental principles of data processing provides the flexibility needed for working with varied makes of equipment and for future changes in equipment and nature of business data processing procedures.

The suggested curricula do not attempt to provide detailed subject units to the extent usually found in a teacher's manual. The unit outlines may not in all cases present topics for coverage in chronological order. Because of such factors as trainee group knowledge, extent of review required, and individual methods of presentation, the sequence of topics is left to the discretion of the individual teacher. In addition, local program administrators and teachers are encouraged to develop detailed lesson plans and obtain appropriate teaching aids. Helpful supplemental materials are to be found in the suggested texts, references, films, and other instructional materials lists.

Introduction to Business Data Processing is scheduled early in the course to provide an overview of the field and to help motivate the trainees. This introductory unit presents topics which are expanded and applied in later units. The Language Skills Unit provided for six of the eight occupations should help build essential background for improved communication skills needed in office work and for study purposes. The unit builds vocabulary, improves spelling, and reviews basic English grammar. Most trainees will also take the Business Communications Unit which should provide for further improvement.

When possible, subjects of like character should be massed in order to simulate conditions of office work. Local availability of teachers and facilities will determine the feasibility of this method. One method of unit grouping is shown in the Curricula Synopses section.

Many of the trainees will have had no office or data processing experience prior to this training program. However, trainees enrolled in the program are expected to have completed approximately 10½ years of formal education and to have a working knowledge of English and elementary arithmetic. Several of the units allow for a review of these important basic subjects, but the need for depth of review in each course unit must be assessed by the local instructor.

In the skill development subjects, lectures and discussions should be kept to the minimum required for understanding procedures and operating instructions. As much time as possible should be devoted to actual trainee practice with the available equipment.

In the social area subjects a variety of methods should be used. Role playing, case analysis, group discussion, lectures and motion pictures—all can be used effectively. Varied presentation can serve to heighten interest, participation, and learning. Although a special unit has not been included in the curricula for developing proper study habits, teachers and administrators should stress this area. Many booklets and pamphlets are available for helping trainees with this important know-how.

Periodic progress checks should be made throughout each unit to evaluate trainee progress toward meeting the Suggested Standards of Achievement. In addition, these checks serve as a guide for reviewing material that may not have been fully learned.

The teacher should consider using resources of the community for assistance with training. Guest speakers from business and industry can assist with special topics and, in addition, can help trainees relate their activities to local business needs and standards.

The greatest challenge for teachers may lie in building the morale of the trainees. Motivation and morale building should be a part of every class and practice period. It is suggested that teachers make an effort early in the program toward establishing a teaching climate which will heighten and maintain the trainee's interest. The success of the program can be judged only by the number of trainees who will remain gainfully employed in careers which would otherwise not have been available to them.

Administrative Options

The Curricula Synopses section of the Introduction shows typical programs for each of the occupations. These programs are based on 6-hour days of instruction. It is recognized that variations in this scheduling may have to be made to suit local conditions. To facilitate administration of the programs and hold the required number of teachers and teaching hours to a minimum, subjects have been grouped to enable one teacher to handle combined groups of trainees at the same time. The number of trainees that may meet in a combined session should be compatible with good teaching practice in terms of span of control, instructional methods and equipment availability.

The curricula for the eight occupations have been planned to develop the abilities needed for employment. Before starting the specialized occupational units the trainee should have skills and knowledge equivalent to that gained from those general office education units suggested as pertinent to his occupation. In order to plan an appropriate program, the trainee's previously acquired abilities and educational background should be evaluated against the Standards of Achievement listed for the required basic units. If the trainee already has acceptable skills in some areas, the instructor or administrator may delete units from the trainee's program and substitute units which would have been given at another time. In this way, subject units can be rearranged to form a more appropriate and meaningful sequence for certain trainees, and the time needed for the development of employable skills can be shortened.

For example, a Key-Punch Operator trainee may present a high-school transcript showing completion of courses in typing and bookkeeping. If the trainee's skill in one of these subjects compares favorably with the Suggested Standards of Achievement listed for Fundamentals of Typing, this particular course may be deleted from his program. The training period could thus be shortened for those trainees presenting this type of achievement, and the trainee could be considered employable at an earlier date. Careful screening of the trainee should disclose the nature and extent of his background. Such pertinent information should be made available to the local program administrator.

Due to this possibility of certain courses being deleted from a trainee's program, some topics have been repeated in certain units. This repetition of topics serves two purposes: to expose trainees to areas of subject content that they may have missed and, in other instances, the topic can be used for refresher purposes.

Supervisory Training Information

In view of the requirements for the Clerical Supervisor and Machine Records Unit Supervisor occupations, trainees selected for these supervisory programs should have exhibited considerable potential to the group responsible for selection. Some trainees for supervisory positions may have comparatively more education and experience than some other trainees. However, the suggested programs for these occupations outlined in the Curricula Synopses section of the Introduction assume little prior experience or education in the clerical field except in the Language Skills area. As in the other occupational programs, a trainee who enters with certain demonstrable skills and knowledge may have unnecessary subject units deleted from his program of study.

Clerical supervisors may become responsible for any of several clerical activities such as bookkeeping, filing or typing. Local employment opportunities as listed on the MDT-1, may determine the trainee's specific area of concentration. Since the areas of specialty cannot be foreseen, the curricula provide a general office education to equip the supervisory trainee with basic skills in several areas. These skills can be augmented by on the job training.

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Three courses, Classification and Coding, Elementary Descriptive Statistics, and Office Calculators, have been shortened in order to accelerate the supervisory programs. Using the outlines for the three courses, instructors may delete topics or reduce time allotted to some topics to effect this reduction in class time. Emphasis should be placed on application of the subject content.

GENERAL OFFICE EDUCATION UNITS

BUSINESS MATHEMATICS I

Hours Required

Class: 1 hour daily

Total: 30 hours

Description

Basic principles of business mathematics with emphasis on the four fundamental operations—addition, subtraction, multiplication, and division—are applied to business situations. The trainee is introduced to the use of simple calculators or adding machines for checking work. Importance of accuracy is stressed. Numerous exercises in applying percentages, discounts, and other mathematical operations should be provided for improving commercial number-handling skills.

Topic Outline

I. Addition Skills
II. Subtraction Skills
III. Multiplication Skills
IV. Division Skills
V. Fractions
VI. Percentage
VII. Sundry Applications

TOPIC I. ADDITION SKILLS

A. Improving skills
  1. Adding whole numbers
  2. Increasing speed
  3. Checking accuracy

B. Types of addition
  1. Horizontal
  2. Horizontal-vertical

C. Addition of decimals

TOPIC II. SUBTRACTION SKILLS

A. Improving skills
  1. Subtracting whole numbers
  2. Checking accuracy

B. Horizontal subtraction

C. Subtraction of decimals

D. Bank reconciliation

E. Making change

TOPIC III. MULTIPLICATION SKILLS

A. Improving skills
  1. Multiplying whole numbers
  2. Checking multiplication accuracy

B. Multiplying decimal numbers (the product of two decimal numbers)

C. Shortcuts in multiplication

D. Horizontal multiplication

E. Extensions

F. Checking multiplication by machine

TOPIC IV. DIVISION SKILLS

A. Improving skills
  1. Division of whole numbers
  2. Checking division accuracy

B. Dividing decimal numbers

C. Shortcuts in division

D. Computing averages

TOPIC V. FRACTIONS

- A. Improving skills in using fractions
    - 1. Changing fractions to equivalent fractions
    - 2. Addition
    - 3. Subtraction
    - 4. Multiplication
    - 5. Division
- B. Aliquot parts

TOPIC VI. PERCENTAGE

- A. Improving skills in using percentage
    - 1. Percentage value in equivalent forms
    - 2. Decimal numbers and fractions as percentage values
    - 3. The percentage formula
- B. Computing depreciation charges

TOPIC VII. SUNDRY APPLICATIONS

- A. Public utility cost computation
- B. Linear, scale, area, and cubic computation
    - 1. Measuring
    - 2. Computing

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Beighey, Clyde and Borchardt, Gordon C. Modern Business Mathematics. 3d ed. New York: McGraw-Hill Book Co., Inc., 1960.
Tests; Teacher's Key.

Briggs, Milton. Mathematics Skill Builder. 2d ed. Cincinnati, Ohio: South-Western Publishing Co., 1960.
Teacher's Manual.

Cutler, Ann and McShare, Rudolph. Tractenberg's Speed System of Mathematics. New York: Doubleday and Co., 1961.

Fisher, Ray W.; Wahl, Frederick D.; and Spencer, Blake W. Arithmetic Review. 2d ed. New York: Pitman Publishing Corp., 1960.

Huffman, Harry. Programmed Business Mathematics, Parts I, II, and III. New York: McGraw-Hill Book Co., Inc., 1962.

————, Twiss, Ruth M. and Whale, Leslie J. Arithmetic for Business and Consumer Use. 2d ed. New York: McGraw-Hill Book Co., Inc., 1962.
Workbook; Teacher's Manual and Key.

McNelly, A. E. and Adams, L. J. Business Arithmetic. 4th ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1958.
Workbook and Tests.

Piper, Edwin B.; Gruber, Joseph; and Curry, Preston E. Applied Business Arithmetic. Complete. 8th ed. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Problems and Drills Manual; Teacher's Manual; Tests 1-8; Teacher's Key.

————, Gruber, Joseph and Curry, Preston E., Applied Business Arithmetic. Abridged. 8th ed. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Problems and Drills Manual; Teacher's Manual; Tests 1-6; Teacher's Key.

Rosenberg, R. Robert. Business Mathematics - Exercises, Problems, and Tests, 2d ed. New York: McGraw-Hill Book Co., Inc., 1959.

————, and Lewis, Harry. Business Mathematics—Principles and Practice. Complete. 6th ed. New York: McGraw-Hill Book Co., Inc., 1958.

————, College Business Mathematics. 3d ed. New York: McGraw-Hill Book Co., Inc., 1961.
Principles and Problems, Teacher's Manual.

BUSINESS MATHEMATICS II

Hours Required

Class: 1 hour daily

Total: 30 hours

Description

Basic and specialized principles of business mathematics are applied to payrolls, retailing, financing, insurance, and taxation. The work in the unit should concentrate on practical applications in several fields.

Topic Outline

I. Payrolls
II. Retailing
III. Financing
IV. Insurance
V. Taxation

TOPIC I. PAYROLLS

A. Mathematical preparation
  1. Time payment (hourly wage system)
  2. Straight piecework wage systems
  3. Bonus pay systems
  4. Currency memorandum
  5. Use of withholding tax tables—national and local

TOPIC II. RETAILING

A. Discount computations (trade and cash)
  1. Series of discounts
  2. Single tax rate equivalent to a series of discount rates
  3. Cash discount and net price
  4. Trade discount and net price

B. Sales computation
  1. Consumer discounts
  2. Discount rates
  3. Markup and markdown
  4. Sales and excise taxes

TOPIC III. FINANCING

A. Interest
  1. Monthly rates
  2. Daily periods
  3. Exact interest
  4. Bankers' 60-day method
  5. Time lapses between two dates
  6. Tables
    (a) Interest
    (b) Time
  7. Compound interest

B. Installment buying and selling
  1. Installment charges
  2. Rate of interest on installment purchases
  3. Automobile installment purchases
  4. Interest rates charged by small-loan agencies

TOPIC IV. INSURANCE

A. Fire and theft

B. Automobile

C. Life

TOPIC V. TAXATION

A. Property taxes

B. Federal and State income taxes

C. Social Security
  1. Primary benefits
  2. Family benefits (on retirement and death of insured)

Texts and Other Teaching Materials

Texts and other teaching materials under Business Mathematics I are applicable to this unit.

The teacher may also wish to give consideration to the use of the following suggested texts and materials. Additional references will be found in Appendix B.

Hadley Editorial Staff and Thistlethwaite, Robert L. Payroll Accounting, 5th ed. New York: McGraw-Hill Book Co., Inc., 1962.

__________, Payroll Record Keeping, 6th ed. New York: McGraw-Hill Book Co., Inc., 1959.

Huffman, Harry and Margulies, Stuart. Programmed Business Mathematics: Concepts, Skills, and Applications, Part II. New York: McGraw-Hill Book Co., Inc., 1962.

Nanassy, Louis C. Standard Payroll Project, 2nd ed. New York: Pitman Publishing Corp., 1962.

Pendery, John A. Clerical Payroll Procedures, 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1959.

Van Voorhis, Robert H., Palmer, Charles E., and Archer, Fred C. College Accounting, Theory, and Practice, Part I. New York: McGraw-Hill Book Co., Inc., 1963.
    Problems and Working Paper for Part I
    Practice Set I

Federal Tax Office-Special Kit: Enlarged form 1040, Handbook, Blank Forms, etc., for Federal Income Taxes.

ELEMENTS OF FISCAL RECORDKEEPING

Hours Required

Class: 1 hour daily, Laboratory: 1 hour daily — Total: 60 hours

Description

The introductory topics of this course unit include general aspects of recordkeeping for business use, including cash, banking, payroll, social security, and tax records. The third and fourth topics of the unit are devoted to an introduction to elementary bookkeeping, including vouchers, checks, invoices, sales, stock record, and purchase order forms. The final topics emphasize the basic elements of bookkeeping, including business transactions, journalizing, posting, preparing financial statements, and cash transactions. Supervised laboratory sessions include skill development through problem solving and the use of practice sets. Since automated recordkeeping is covered in depth in other units, teachers should use this topic for meaningful association.

Topic Outline

I. Purpose and Use of Records
II. Types of Records
III. Common Business Record Forms
IV. Introduction to Bookkeeping

V. Bookkeeping Fundamentals
VI. Accounts
VII. Business Transactions
VIII. Journalizing and Posting
IX. Trial Balance
X. Work Sheets and Financial Reports
XI. Closing Ledgers

TOPIC I. PURPOSE AND USE OF RECORDS

A. Why records are kept

B. Organizing records for
  1. Ease of access
  2. Ease of interpretation
  3. Legibility

C. Business and records

D. Automated recordkeeping

TOPIC II. TYPES OF RECORDS

A. Cash records

B. Banking records

C. Payroll records

D. Social Security records

E. Tax records

F. Daybook and general journal

G. Time records

TOPIC III. COMMON BUSINESS RECORD FORMS

A. Purchase orders, sales invoices, and receipts

B. Stock records and requisitions

TOPIC IV. INTRODUCTION TO BOOKKEEPING

A. Cash
  1. Receiving
  2. Paying
  3. Forms: vouchers, checks, etc.
  4. Banking

B. Credit
  1. Sales
  2. Purchases

C. Financial records and statements

TOPIC V. BOOKKEEPING FUNDAMENTALS

A. Assets and liabilities

B. Proprietorship

C. Bookkeeping equation

D. Balance sheets

TOPIC VI. ACCOUNTS

A. "T" accounts

B. Recording changes

TOPIC VII. BUSINESS TRANSACTIONS

A. Opening transactions

B. Changes in assets

C. Changes in liabilities

D. Changes in proprietorship

TOPIC VIII. JOURNALIZING AND POSTING

TOPIC IX. TRIAL BALANCE

A. Preparation

B. Locating errors

TOPIC X. WORK SHEETS AND FINANCIAL REPORTS

A. Preparation of work sheets

B. Preparation of financial reports

TOPIC XI. CLOSING LEDGERS

A. Closing entries

B. Balancing the accounts

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commerically available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Baron, Harold and Steinfeld, Solomon C. Clerical Record Keeping. Cincinnati, Ohio: South-Western Publishing Co., 1959.

Working Papers & Supplementary Problems, Units 1-6 and Units 7-10; also, Teacher's Manual.

Barron, Allan E. and Taylor, James R. Clerical Office Training. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

Breidenbaugh, Vachel E.; Lins, Angeline G.; and Elwell, Fayette H. Bookkeeping Principles. New York: Pitman Publishing Corp., 1958.

Carlson, Paul A. Drills and Problems in Bookkeeping & Accounting. Cincinnati, Ohio: South-Western Publishing Co., 1959.

Solutions Manual.

________, Forkner, Hamden L. and Boynton, Lewis D., 20th-Century Bookkeeping & Accounting. 22d ed. First-Year Course. Cincinnati, Ohio: South-Western Publishing Co., 1962.

Working papers and Study Guides; Bradford Wholesale Grocery Set, business papers and blanks; Clayton Retail Hardware Set, business papers and blanks; Insurance Broker Set (partnership); Service Station Set, 2d ed. (sole proprietorship); also, Teacher's Manual, overhead projector transparencies.

Clerical Practice and Record Keeping. 2d ed. Baltimore, Md.: H. M. Rowe Co.

Freeman, M. Herbert; Hanna, J. Marshall; and Kahn, Gilbert. Gregg Bookkeeping and Accounting. 3d ed. New York: McGraw-Hill Book Co., Inc., 1963.

Practice Sets; Workbooks; Objective Tests; Teacher's Manual and Key; Correlated Series of Six Filmstrips.

Heiges, P. Myer; Schneider, Arnold E.; and Huffman, Harry. General Record Keeping, 4th ed. New York: McGraw-Hill Book Co., Inc., 1959.

Workbook for 4th edition; Working Papers for the Magic Star Practice Set; Teacher's Manual and Key, 4th edition; Tests; Teacher's Key for Tests.

Kirk, John G.; Crawford, Maurice L.; and Quay, Mark H. General Clerical Procedures. 3d ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Workbook I; Chapter Tests.

Olson, Milton C.; Zelliott, Ernest A.; and Leidner, Walter E. Introductory Bookkeeping. 3d ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961.

Workbook I, '61; Progress Tests.

Perry, Enos C.; Frakes, John C.; and Zabornik, Joseph J. Clerical Record Keeping. New York: Pitman Publishing Corp., 1957.

In addition, the teacher may wish to secure record forms from local business firms and reproduce them for classroom use.

Wolpert, Saul. Bookkeeping and Accounting: Introductory Course 7th ed. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960.

Van Voorhis, Robert H.; Palmer, Charles E., and Archer, Fred C. College Accounting, Theory and Practice, Part I. New York: McGraw-Hill Book Co., Inc., 1963.

Problems and Working Papers for Part I; Practice Set I.

PAYROLL RECORDS

Hours Required

Class: 1 hour daily

Total: 30 hours

Description

This unit includes analysis of payroll legislation, intensive practical application of accounting principles to payroll procedures, and coverage of how data processing equipment is used in payroll operations. The unit should include sessions for skill development in which the trainee works with practice sets and uses realistic "write-it-once" forms.

Topic Outline

I. Payroll Accounting
II. Payroll Procedures
III. Payroll and Tax Reports
IV. Other Payroll Deductions

TOPIC I. PAYROLL ACCOUNTING

TOPIC II. PAYROLL PROCEDURES

A. Time cards

B. Payrolls (hourly, weekly, biweekly, monthly)

C. Year-end procedures

D. Pegboard, keysort, accounting machine payroll applications

TOPIC III. PAYROLL AND TAX REPORTS

A. Federal taxes
  1. Old-age tax (F. I. C. A.) and benefits
  2. Unemployment insurance
  3. Income (withholding) tax

B. State taxes

TOPIC IV. OTHER POSSIBLE PAYROLL DEDUCTIONS

A. Saving plans, including Credit Unions

B. Insurance plans

C. Other deductions
  1. Garnishments
  2. Union dues

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Felter, Emma and Reynolds, Marie. Basic Clerical Practice, 2d ed. New York: McGraw-Hill Book Co., Inc., 1959.

________, Payroll Accounting. 5th ed. New York: McGraw-Hill Book Co., Inc., 1962.

Hadley Editorial Staff and Thistlethwaite, Robert L. Payroll Record Keeping, 6th ed. New York: McGraw-Hill Book Co., Inc., 1959.

Enveloped Booklets; Business Papers and Reports; Teacher's Key.

Huffman, Harry. Programmed Business Mathematics, Part II. New York: McGraw-Hill Book Co., Inc., 1962.

Nanassy, Louis C. Standard Payroll Project. 2d ed. New York: Pitman Publishing Corp., 1962.

Pendery, John A. Clerical Payroll Procedures, 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1959.
    Teacher's Manual. 3d ed.

Van Voorhis, Robert H.; Palmer, Charles E.; and Archer, Fred C. College Accounting, Theory and Practice, Part I. New York: McGraw-Hill Book Co., Inc., 1963.
    Problems and Working Papers for Part I Practice Set I.

It is suggested that the teacher obtain payroll forms from local business firms and reproduce them for classroom use.

LANGUAGE SKILLS

Hours Required

Class: 1 hour daily   Total: 30 hours

Description

This unit is designed to build vocabulary, develop spelling ability, and provide opportunity to apply principles of English grammar. Emphasis should be placed on proper use of word forms and good sentence construction. Trainees should be encouraged to do outside reading and develop an interest in data processing terminology and other new words.

Topic Outline

I. Importance of Spelling and Vocabulary Development
II. Pretest
III. Spelling by Sound and Meaning
IV. Spelling Rules
V. Word Forms
VI. Sentence Structure
VII. Capitalization and Punctuation

TOPIC I. IMPORTANCE OF SPELLING AND VOCABULARY DEVELOPMENT

A. Word meanings and usage

B. General vocabulary

C. Business vocabulary

D. Accounting, personnel, and management vocabulary

E. Banking and insurance vocabulary

F. Data processing vocabulary

TOPIC II. PRETEST

A. Determination of vocabulary level, spelling ability, and grammatical knowledge

TOPIC III. SPELLING BY SOUND AND MEANING

A. Spotting errors

B. Attacking errors

C. Use of dictionary

TOPIC IV. SPELLING RULES

A. Rule errors

B. Carelessness and demon errors

C. Correcting rule errors and other difficulties

D. Abbreviations

TOPIC V. WORD FORMS

A. Nouns

B. Pronouns

C. Verbs

D. Adjectives

E. Adverbs

F. Prepositions

G. Conjunctions

TOPIC VI. SENTENCE STRUCTURE

A. Simple sentences and phrases

B. Clauses in compound and complex sentences

C. Effective sentences and paragraphs

TOPIC VII. CAPITALIZATION AND PUNCTUATION

A. Proper nouns

B. Special uses of capitalization

C. Punctuation
   1. Period, question mark, and exclamation mark
   2. Comma, semicolon, and colon
   3. Apostrophe and hyphen
   4. Quotation mark and italics
   5. Parentheses and dashes

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Anderson, Ruth; Straub, Lura Lynn; and Gibson, E. Dana. Word Finder. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.

Crank, Doris; Crank, Floyd; and Connelly, Mary. Words: Spelling, Pronunciation, Definition, and Application, 5th ed. New York: McGraw-Hill Book Co., Inc., 1962.
Instructor's Guide.

Doris, Lillian and Miller, Besse. Complete Secretary's Handbook. 2d ed. Englewood Cliffs, N. J.: Prentice-Hall, 1960.

Gavin, Ruth E. and Hutchinson, E. Lillian. Reference Manual for Stenographers and Typists, 3d ed. New York: McGraw-Hill Book Co., Inc. 1961.

Gilmartin, John G. Word Study, 5th ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1955.

Himstreet, William C.; Porter, Leonard J.; and Maxwell, Gerald W. Business English in Communications. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964.
Activities Book: Text Book.

Hodges, John C. and Connolly, Francis X. Harbrace College Handbook, 5th ed. New York: Harcourt, Brace, and World., Inc., 1962.

Hutchinson, Lois. Standard Handbook for Secretaries. 7th ed. New York: McGraw-Hill Book Co., Inc., 1960.

Kierzek, John M. and Gibson, Walker. Macmillan Handbook of English, 4th ed. New York: The Macmillan Co., 1960.

Johnson, H. Webster. How to Use the Business Library. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1963.

Larson, Greta. Business English Essentials. 2d ed. New York: McGraw-Hill Book Co., Inc., 1959.

Larson, Lenna A. and Koebele, Apollonia M. Reference Manual for Office Employees, 4th ed. Cincinnati, Ohio: South-Western Publishing Co., 1960.

Leslie, Louis A. 20,000 Words—Spelled, Divided, and Accented. 4th ed. New York: McGraw-Hill Book Co., Inc., 1959.

Malsbary, Dean R. Spelling and Word Power. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1958.
Tests and Practice (Workbook).

Mayo, Lucy G. Communications Handbook for Secretaries. New York: McGraw-Hill Book Co., Inc., 1958.
Workbooks I and II; Teacher's Manual and Key.

Menning, J. H. and C. W. Wilkinson. Communication Through Letters and Reports. 3d ed. Homewood, Ill.: Richard D. Irwin, Inc., 1963.

Monro, Kate M. and Wittenburg, Mary Alice. Modern Business English. 3d ed. New York: McGraw-Hill Book Co., Inc., 1962.

Nanassy, Louis C. and Selden, William. Business Dictionary. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.

Norman, Lewis, ed. The New Roget's Thesaurus of the English Language in Dictionary Form. Garden City, N. Y.: Garden City Books, 1961.

Parkhurst, Charles C. Business Communications for Better Human Relations. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961.

________, Practical Problems in English for Business. 3d ed. New York: Pitman Publishing Corp., 1962.

Shachter, Norman. English the Easy Way. 2d ed. Cincinnati, Ohio: South-Western Publishing Co., 1960.
Tests and Final Examinations; Teacher's Manual.

Shaw, Harry. Spell It Right. New York: Barnes & Noble, Inc., 1961.

Shurter, R. L. Written Communication in Business. New York: McGraw-Hill Book Co., Inc., 1957.

Silverthorn, J. E. Word Division Manual. Cincinnati, Ohio: South-Western Publishing Co., 1958.

Stewart, Marie M.; Hutchinson, E. Lillian; Lanham, Frank W.; and Zimmer, Kenneth. Business English and Communication. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.
Workbook; Objective Tests.

Taintor, Sarah August and Monro, Kate M. The Secretary's Handbook; A Manual of Correct Usage. 8th ed. New York: The Macmillan Co., 1958.

Walters, R. G. and Lamb, Marion M. Word Studies. 5th ed. Cincinnati, Ohio: South-Western Publishing Co., 1963.
Workbook; Spelling tests, including Final Examination; Teacher's Manual.

Watkins, Floyd C. and Martin, Edwin T. Practical English Handbook. Boston: Houghton Mifflin Co., 1961.

Wykoff, George S. and Shaw, Harry. Harper Handbook of College Composition. 3d ed. New York: Harper & Bros., 1962.

A standard dictionary is also suggested, such as The American College Dictionary (New York: Random House) or Webster's New Collegiate Dictionary (Springfield, Mass.: G. and C. Merriam Co.)

BUSINESS COMMUNICATIONS

Hours Required

Class: 1 hour daily Total: 30 hours

Description

This unit emphasizes the importance of effective business communication and the need for careful planning and consideration of the reader before beginning to write. The types of business communications covered include letters, postal cards, memoranda, reports, telegrams, and other communications; attention is given also to effective oral communication. Finding and using sources of information on correct English usage are also included. Practice exercises in report writing should be provided frequently.

Topic Outline

I. Communicating in Business
II. Fundamentals of Effective Written Communication
III. Types of Business Correspondence
IV. Good English in Oral Communications

TOPIC I. COMMUNICATING IN BUSINESS

A. The importance of written and oral communication in business

B. The communicating process
  1. Some basic semantic principles
  2. Brief review of English grammar (as needed)
  3. Sources of information on English, special forms of address, etc.
    a. English handbooks and secretarial handbook
    b. Dictionaries
    c. Thesaurus

TOPIC II. FUNDAMENTALS OF EFFECTIVE WRITTEN COMMUNICATION

A. Goals of business writing; planning the communication

B. Basic qualities of business letters and reports

C. Mechanics of the letter
  1. Essential parts; other parts
  2. Layout, form, most used styles
  3. Addressing the envelope

D. Avoidance of business jargon, stock phrases, etc.

TOPIC III. TYPES OF BUSINESS CORRESPONDENCE

A. Specific types of business letters
  1. Neutral and good-news messages
    a. Inquiries, orders, answers and acknowledgments, remittances
    b. Public relations, industrial relations, personnel
  2. Persuasive messages
  3. Messages of regret or refusal
  4. Application letters

B. Memoranda and reports
  1. Simple reports (practice exercises in writing)
  2. Complex reports (practice in organization and writing)

C. Telegrams

TOPIC IV. GOOD ENGLISH IN ORAL COMMUNICATIONS

A. In an interview

B. Communicating with people

Texts and Other Teaching Materials

Texts and other teaching materials under Language Skills are applicable to this unit.

The teacher may also wish to give consideration to the use of the following suggested texts and materials. Additional references will be found in Appendix B.

Brown, Leland. Communicating Facts and Ideas in Business. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1961.

Ingram, Karl Culton. Talk That Gets Results—Communication: Key to Success and Harmony with Others. New York: McGraw-Hill Book Co., Inc., 1957.

Schutte, William M. and Steinberg, Erwin R. Communication in Business and Industry. New York: Holt, Rinehart, and Winston, Inc., 1960.

PERSONAL DEVELOPMENT

Hours Required

Class: 1 hour daily   Total: 30 hours

Description

The first three topics in this unit are designed to help the trainee establish personal standards of conduct and appearance that conform to general office expectancies. Emphasis is placed on office customs and etiquette and on expected conduct with superiors. Guided group discussion and guest speakers from the business community are suggested to motivate trainees and encourage them to accept general business standards as their own.

Topics IV through VIII are designed to guide the trainee in the establishment of effective human relations in an office situation. The nature and importance of personality and behavior are stressed. The trainee should receive individual guidance in self-appraisal and self-improvement.

Topic Outline

I. Office Etiquette
II. Employee-Employer Relationships
III. Business Customs
IV. The Nature and Importance of Personality
V. Roles of Motives and Emotions
VI. The Role of Intelligence
VII. Personal Efficiency
VIII. Social Efficiency: Human Relations, Teamwork

TOPIC I. OFFICE ETIQUETTE

A. Behavior
   1. Acceptable office behavior
   2. Mannerisms
   3. Speech
   4. Attitude

B. Appearance
   1. Grooming
   2. Wardrobe
   3. Health and posture

C. Good public relations
   1. Customers and callers
   2. Introductions
   3. Telephone etiquette

TOPIC II. EMPLOYEE-EMPLOYER RELATIONSHIPS

A. Seeking a job

B. Orientation on a new job

C. Progress on the job

D. Punctuality, attendance, break periods

E. Performance during office-business emergencies

F. Mutual respect and courtesy

TOPIC III. BUSINESS CUSTOMS

A. In the office

B. While traveling

C. Meetings
   1. Appropriate participation
   2. Parliamentary procedures
   3. Speaking in public

TOPIC IV. THE NATURE AND IMPORTANCE OF PERSONALITY

TOPIC V. ROLES OF MOTIVES AND EMOTIONS

A. Importance and nature of motives

B. Emotional stability
   1. Place of emotions in one's life
   2. Meaning and attainment of emotional maturity

TOPIC VI. THE ROLE OF INTELLIGENCE

A. Understanding ourselves and others

B. Intelligent behavior

C. Problem-solving and decision making

TOPIV VII. PERSONAL EFFICIENCY

A. Methods for self-appraisal

B. Self-development and self-improvement
   1. Improving appearance, voice and speech, manners, etc.
   2. Improving concentration, memory, reading, learning, confidence

C. Procedures for improvement
   1. Improving communication skills
   2. Broadening interests
   3. Developing or changing habits

TOPIC VIII. SOCIAL EFFICIENCY: HUMAN RELATIONS, TEAMWORK

A. Good human relations with co-workers

B. Good human relations with superiors and subordinates

C. Healthful adjustment to groups

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commerically available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Agnew, Peter L. and Meehan, James R. *Clerical Office Practice. 3d ed.* Cincinnati, Ohio: South-Western Publishing Co., 1961.

Archer, Fred C.; Brecker, Raymond F.; and Frakes, John C. *General Office Practice. 2d ed.* New York: McGraw-Hill Book Co., Inc., 1963.

Barron, Allan E. and Taylor, James R. *Clerical Office Training*. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

Beamer, Esther K.; Marshall, Hanna J.; and Popham, Estelle L., Effective Secretarial Practices. 4th ed. Cincinnati, Ohio: South-Western Publishing Co., 1962.
Workbook; Instructor's Manual

Becker, Esther R. and Lawrence, Richard L. Success and Satisfaction in Your Office Job. New York: Harper & Bros., 1954.

Carney, Marie L. Etiquette in Business. New York: McGraw-Hill Book Co., Inc., 1948.
Filmstrips: Set I (1-6), Set II (7-11).

Coleman, James C. Personal Dynamics and Effective Behavior. Chicago: Scott, Foresman & Co., 1960.

Famularo, Joseph J. Supervisors in Action. New York: McGraw-Hill Book Co., Inc., 1961.

Friedman, Sherwood and Grossman, Jack. Secretarial Practice. New York: Pitman Publishing Corp., 1960.

Gregg, John Robert; Fries, Albert C.; Rowe, Margaret; and Travis, Dorothy. Applied Secretarial Practice, 5th ed. New York: McGraw-Hill Book Co., Inc., 1962.

Keily, Helen J. and Walters, R. G. How to Find and Apply for a Job. 2d ed. Cincinnati, Ohio: South-Western Publishing Co., 1960.

Laird, Donald A. and Eleanor C., Practical Business Psychology. 3d ed. New York: McGraw-Hill Book Co., Inc., 1961.

MacGibbon, Elizabeth Gregg. Fitting Yourself for Business. 4th ed. New York: McGraw-Hill Book Co., Inc., 1961.

Mayo, Lucy Graves. Communications Handbook for Secretaries. New York: McGraw-Hill Book Co., Inc., 1958.

McLean, Beth Bailey and Paris, Jeanne. The Young Woman in Business. Ames, Iowa: Iowa State University Press, 1962.

Newton, Roy and Green, Helen. How to Improve Your Personality, 3d ed. New York: McGraw-Hill Book Co., Inc., 1963.

Ruch, Floyd L. Psychology and Life: A Study of the Thinking, Feeling, and Doing of People. 5th ed. Complete or Abridged. Chicago: Scott, Foresman and Co., 1959.
Booklet of Test Items; Instructor's Manual.

Russon, Allien. Business Behavior, 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1964.

Sferra, Adam; Wright, Mary E.; and Rice, Louis A. Personality and Human Relations, 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.

Shidle, Norman G. Getting Along with Others in Business. New York: B. C. Forbes, 1947.

Stickney, Rufus and Blanche G.; Flood, Kathleen; Horton, Helen J.; and Weil, Harriet S. Office and Secretarial Training, 4th ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Wilson, Everett B. and Wright, Sylvia B. Getting Along with People in Business. New York: Funk and Wagnalls Co., 1950.

BUSINESS PRINCIPLES AND ORGANIZATION I

Hours Required

Class: 1 hour daily

Total: 30 hours

Description

This unit provides an introduction to the study of the organization of businesses. Strong emphasis is placed on the principles of economics, governmental activity and the importance of and principles of good management. The trainee should also be given an indication of some of the principal governmental legislation affecting business enterprise.

Topic Outline

I. Business Enterprise
II. Principles of Economics
III. Government and Business
IV. Principles of Management

TOPIC I. BUSINESS ENTERPRISE

A. The nature of business in the American economy
  1. Scope of business enterprises
  2. Opportunities in business

B. Single proprietorship
  1. Legal structure
  2. Nature of businesses of this type
  3. Earmarks of efficiency

C. Partnership
  1. Legal structure
  2. Nature of businesses of this type
  3. Earmarks of efficiency

D. Corporation
  1. Legal structure
  2. Nature of businesses of this type
  3. Earmarks of efficiency

E. Cooperatives

TOPIC II. PRINCIPLES OF ECONOMICS

A. Money and banking systems

B. Economic cycles

C. Role of Government in the economy
  1. Profit objectives
  2. Business cycles

TOPIC III. GOVERNMENT AND BUSINESS

A. Key areas of governmental legislation and taxation

B. Encouragement of business activity

TOPIC IV. PRINCIPLES OF MANAGEMENT

A. Overall responsibilities of management

B. Organization of management

C. Patterns of operation
  1. Planning
  2. Organizing
  3. Directing
  4. Integrating
  5. Controlling

D. Key executives responsible for management functions

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Aberle, J. W.; Sielaff, T. J.; and Mayer, F. L. General Business for Today and Tomorrow. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Crabbe, Ernest H.; Enterline, Herman G.; and DeBrum, S. Joseph. General Business. 8th ed. Cincinnati, Ohio: South-Western Publishing Co., 1961.
  Workbook, 1st semester; Workbook 2d semester; Tests 1-7 and Examination; Tests 8-14 and Examination; Manual and Key.

Hurley, Morris L. Business Administration. 2d ed. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.

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Keith, Lyman A. and Gubellini, Carlo E. Business Management. New York: McGraw-Hill Book Co., Inc., 1958.
Instructor's Manual.

Littlefield, C. L. and Peterson, R. L. Modern Office Management. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1956.

Polishock, W. M. Today's General Business. Boston: Ginn and Co., 1959.
Workbook: Tests and Manual.

Price, Ray G.; Musselman, Vernon; and Weeks, Edwin E. General Business for Everyday Living. 2d ed. New York: McGraw-Hill Book Co., Inc., 1960.
Workbooks; Tests; Correlated Filmstrips; Teacher's Manual.

Shilt, Bernard A. and Wilson, W. Harmon. Business Principles and Management. 4th ed. Cincinnati, Ohio: South-Western Publishing Co., 1961.

Tonne, Herbert A.; Simon, Sydney L.; and McGill, E. C. Business Principles, Organization, and Management. 2d ed. New York: McGraw-Hill Book Co., Inc., 1963.

BUSINESS PRINCIPLES AND ORGANIZATION II

Hours Required

Class: 1 hour daily — Total: 30 hours

Description

In this unit emphasis is placed upon financial management, production management, marketing and merchandising, and personnel and human relations in terms of providing the trainee with a deeper awareness and understanding of the complexity of business management and decision-making at upper levels of management which may affect him in his day-to-day activities.

Topic Outline

I. Financial Management
II. Production Management
III. Marketing and Merchandising
IV. Personnel and Human Relations

TOPIC I. FINANCIAL MANAGEMENT

A. Executives and responsibilities

B. Financial decisions

C. Internal financial management
   1. Financial accounting
   2. Determination of profits
   3. Determination and control of costs
   4. Budgets and budgetary control
   5. Taxes and their impact on business
   6. Risks and insurance

D. The role of business data processing in decision making

TOPIC II. PRODUCTION MANAGEMENT

A. Responsibilities of executives and departments
   1. Skills and knowledges needed
   2. Nature of job responsibilities

B. Planning production and scheduling

C. Factors of production

D. Problems of production

E. Control of production and measuring its effectiveness

TOPIC III. MARKETING AND MERCHANDISING

A. The role of marketing in the American economy

B. The extent of the marketing activity—numbers of people and nature of the enterprises

C. Distribution activities
   1. Organization
   2. Implementation

D. Marketing activities
   1. Buying
   2. Pricing
   3. Selling

E. Merchandising activities
   1. Structure
   2. Promotion and advertising
   3. Display and selling
   4. Delivery and shipping

F. The efficiency of marketing and merchandising in the American economy

TOPIC IV. PERSONNEL AND HUMAN RELATIONS

A. Responsibilities of executives and department supervisors

B. Identification of need for workers

C. Recruitment, selection, and training of employees

D. Determination of wage scales, Social Security, and workmen's protection

E. Employer-employee relations

Texts and Other Teaching Materials

All texts and materials listed under Business Principles and Organization I are applicable to this unit.

FUNDAMENTALS OF TYPING

Hours Required

Class: 2 hours daily — Total: 60 hours

Description

This unit is designed to introduce the trainee to touch control of the keyboard and correct operation of all manipulative parts of the typewriter. Supervised skill development sessions are an integral part of the course. Concentration should be on good techniques as well as on the development of speed and accuracy through exercises. (The demonstration of proper techniques by the teacher is vital.) The course also includes a brief orientation to the basic patterns of arranging correspondence, manuscripts, tables, and some business forms.

Topic Outline

- I. Machine Fundamentals
- II. Typewriting Procedures and Techniques
- III. Development of Concepts of Standards
- IV. Basic Skill Development
- V. Brief Introduction to Application of Typewriting Skill
- VI. Auxiliary Knowledges and Skills

TOPIC I. MACHINE FUNDAMENTALS

- A. Knowledge of parts used by the beginning typist
  - 1. Identification (as and when needed)
  - 2. Function and use
- B. Manual and electric typewriters (if both are used)
  - 1. Similarities
  - 2. Differences

TOPIC II. TYPEWRITING PROCEDURES AND TECHNIQUES

- A. Proper position
  - 1. Hand position
  - 2. Arm position
  - 3. Overall posture; relationship of chair and table to correct posture
- B. Paper insertion and removal
- C. Key stroking—manual, electric
- D. Operation of additional service parts—tabulator, backspacer, margin release, variable spacer, etc.

TOPIC III. DEVELOPMENT OF CONCEPTS OF STANDARDS

- A. In speed
- B. In accuracy
  - 1. How to proofread (for content, not typing errors alone)
  - 2. How to correct
    - a. Erasing
    - b. Spreading and crowding
- C. In neatness and attractiveness of typewritten product
  - 1. General
  - 2. Layout—arrangements, spacing, etc.
  - 3. Corrections
  - 4. Mailability
- D. In acceptability of the mechanics of English
  - 1. Language usage
  - 2. Spelling
  - 3. Punctuation, capitalization, etc.

TOPIC IV. BASIC SKILL DEVELOPMENT

- A. Keyboard mastery and an understanding of the principles of touch typewriting
- B. Composing at the typewriter
- C. Areas for improvement
  - 1. Increased accuracy through control, proper techniques
  - 2. Increased speed through proper machine manipulation as well as stroking
  - 3. Product quality

TOPIC V. BRIEF INTRODUCTION TO APPLICATION OF TYPEWRITING SKILL

- A. Simple letters and envelopes
- B. Memos
- C. Simple manuscript typing, including reports
- D. Simple tabulation and centering
- E. Simple business forms and records

TOPIC VI. AUXILIARY KNOWLEDGES AND SKILLS

- A. Proper care of machine
  - 1. Use of dust cover
  - 2. Cleaning type
  - 3. Proper techniques when erasing
  - 4. Changing ribbons
- B. Use of carbon paper
- C. Correct interpretation of edited copy, simple rough drafts

Texts and Other Teaching Materials

From the suggested texts and materials listed below (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Altholz, Gertrude. Modern Typewriting Practice. 3d ed. New York: Pitman Publishing Corp., 1962.

Blackstone, Bruce I. Technique, Speed, and Accuracy Typing. Englewood Cliffs, N. J.; Prentice-Hall, Inc., 1956.

Connelly, Mary and Porter, Leonard J. Typing Speed Builders. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962.

Grubbs, Robert L. and White, James L. Sustained Timed Writings. 2d ed. New York: McGraw-Hill Book Co., Inc., 1963.

Leslie, Louis A. and Pepe, Philip S. Typing Simplified. 2d ed. New York: American Book Co., 1960.

Lessenberry, D. D.; Crawford, T. James; and Erickson, Lawrence W. 20th Century Typewriting—Elementary Course. 8th ed. Cincinnati, Ohio: South-Western Publishing Co., 1962.
Workbook; Teacher's Manual; Tests; Records and Tapes.

Lloyd, Alan C.; Rowe, John L.; and Winger, Fred E. Typing Power Drills. New York: McGraw-Hill Book Co., Inc., 1956.

Mount, Dick and Hansen, Kenneth J. Progressive Typewriting Speed Practice. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.

Nelson, Roger H. Accelerated Typing. Salt Lake City, Utah: Business Education Publishers, Inc., 1959.

Oliverio, Mary Ellen and Palmer, Harold O. Graded Time Writings. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959.

Reigner, Charles G. and Rygiel, Walter S. Rowe Typing. 4th ed. Baltimore, Md.: H. M. Rowe Co., 1958.

Rowe, John L. and Etier, Faborn. Typewriting Drills for Speed and Accuracy. 2d ed. New York: McGraw-Hill Book Co., Inc., 1959.

________, Lloyd, Alan C., and Winger, Fred E. Gregg Typing—191 Series, Book One, General Typing; and Gregg Typing—191 Series, Book Two Office Production Typing. New York: McGraw-Hill Book Co., Inc., 1962.

Tidwell, M. Fred and Stuart, Esta Ross. Tidwell-Stuart Typing—One Year Course. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964.
Workbook; Teacher's Manual.

Wanous, S. J. and Wanous, E. W. Basic Typewriting Drills. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1958.

PRODUCTION TYPING

Hours Required

Class: 2 hours daily

Total: 60 hours

Description

This unit provides further supervised speed and accuracy development integrated with basic production of correspondence, business forms, manuscripts, and tabulated material. Emphasis is placed upon following accurately whatever directions are given and using judgment when detailed instructions are lacking. The goal is to help the trainee become a thinking typist, rather than a mechanical copyist. Numerous opportunities should be provided for trainees to evaluate the quality and quantity of their own work. It is recommended that, to the extent practicable, some use be made of forms and stationery from the business community.

Topic Outline

I. Review of Fundamentals
II. Further Development of Concepts of Standards
III. Further Skill Development
IV. Advanced Applications of Typing Skill
V. Auxiliary Knowledges and Skills

TOPIC I. REVIEW OF FUNDAMENTALS

A. Keyboard—touch control

B. Posture

C. Techniques in stroking, shifting, operation of service parts, etc.

D. Machine parts—function and proper operation

E. Care of machine

TOPIC II. FURTHER DEVELOPMENT OF CONCEPTS OF STANDARDS

A. Speed: usable piece of work in reasonable length of time

B. Accuracy: responsibility for correctness of typing, English mechanics, verification of content (dates, quantities, and other facts)

C. Appearance of the typewritten product according to business standards

TOPIC III. FURTHER SKILL DEVELOPMENT

A. Keyboard mastery, including the number and symbol keys

B. More refined control of other manipulative parts

C. Learning to use judgment for letter placement, tabular arrangement, centering, etc.

D. Increased speed, accuracy, and overall product quality

TOPIC IV. ADVANCED APPLICATIONS OF TYPING SKILL

A. Letters and memos, including displayed material, special lines, two pages, etc.

B. Manuscripts and reports

C. Tabulations, including column headings, ruling, etc.

D. Various kinds of business forms and office records

E. Complicated rough drafts

F. Offset masters, stencils, spirit masters

G. Chain feeding of envelopes

TOPIC V. AUXILIARY KNOWLEDGES AND SKILLS (as required)

A. Following written and oral instructions if given; working with a minimum of direction when detailed instructions are not given.

B. Knowing appropriate supplies to use—paper, carbon sets, eraser, stencils, etc.

C. Caring for machine—keeping type clean, using ribbon of suitable intensity, etc.

Texts and Other Teaching Materials

Most of the texts and other teaching materials under Fundamentals of Typing are applicable to this unit.

The teacher may also wish to give consideration to the use of the following suggested texts and materials. Additional references are listed in Appendix B.

Agnew, Peter L. Typewriting Office Practice. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1960.
Anderson, Ruth I., and Porter, Leonard J. 130 Basic Typing Jobs. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.
Bell, Mary L. Speed Typing. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1959.
Fries, Albert C. Timed Writings about Careers. Cincinnati, Ohio: South-Western Publishing Co., 1963.
________, Nanassy, Louis C. Business Timed Writings. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.
Frisch, Vern A. and Sivinski, Joan. Applied Office Typewriting. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.
  Enveloped kit
Hossfield, George L. and Nelson, Julius. Faster Typing. Baltimore, Md.: H. M. Rowe Co., 1958.
Liquori, F. Basic Typing Operations. Cincinnati, Ohio: South-Western Publishing Co., 1964 (available summer).
Lloyd, Alan C.; Rowe, John L.; and Winger, Fred. Typing Skill Drives. New York: McGraw-Hill Book Co., Inc., 1960.
  Teaching tapes for Typing Skill Drives.
MacClain, Lenore Fenton, and Dame, J. Frank. Typewriting Techniques and Short Cuts. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1961.
Mount, Dick and Hansen, Kenneth J. Progressive Typewriting Speed Practice. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.
Rowe, John L.; Lloyd, Alan C.; and Winger, Fred. Gregg Typing/191 Series, Book Two—Office Production Typing. New York: McGraw-Hill Book Co., Inc., 1963.
  Learning Guides and Working Papers for Book Two—Office Production Typing, Parts 1-6
  Learning Guides and Working Papers for Book Two—Office Production Typing, Parts 7-12.

OFFICE CALCULATORS

Hours Required

Class: 1 hour daily

Total: 30 hours

Description

The objective of this unit is development of moderate skill in the use of the 10-key and full-key adding machines, and rotary and printing calculators. Considerable emphasis is given to skill development in 10-key machines, operating them by touch. Application is made to business

business documents. When possible, work materials for this unit can be those used in Fundamentals of Accounting.

Topic Outline

I. 10-key Adding Machines and Printing Calculators
II. Full-key Adding Machines
III. Rotary Calculators
IV. Practical Applications

TOPIC I. 10-KEY ADDING MACHINES AND PRINTING CALCULATORS

A. Adding by touch

B. Subtraction

C. Multiplication

D. Decimals and fractions

E. Division on the printing calculator

TOPIC II. FULL-KEY ADDING MACHINES

A. Addition

B. Subtraction

C. Multiplication

D. Decimals and fractions

E. Division

TOPIC III. ROTARY CALCULATORS

A. Addition

B. Multiplication

C. Decimals

D. Subtraction

E. Division

TOPIC IV. PRACTICAL APPLICATIONS

A. Checks

B. Invoices

C. Stock records

D. Sales reports

E. Basic accounting records

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Agnew, Peter L. Machine Office Practice. Cincinnati, Ohio: South-Western Publishing Co., 1959.

________, and Cornelia, Nicholas J., Office Machine Course. 3rd ed. Cincinnati: South-Western Publishing Co., 1962.
Practice Materials; Solutions Manual.

________, and Pasewark, William R. Full-Keyboard Adding Listing Machine Course. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1963.

________, Ten-Key Adding Listing Machine and Printing Calculator Course. 3d ed. Cincinnati, Ohio: South-Western Publishing Co., 1963.
Teacher's Manual.

Fasnacht, Harold D. and Bauernfeind, Harry B. How to Use Business Machines. 2d ed. New York: McGraw-Hill Book Co., Inc., 1962.

Gibson, E. Dana. Adding Machine Systems. Dubuque, Iowa: Wm. C. Brown Co., 1960.

Johnson, Mina M. and Pactor, Paul. Ten-Key Adding Machine Course. New York: Pitman Publishing Corp., 1956.

Keelon, John K. Tested Problems for Calculators and Listing Machines. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1959.

Meehan, James R., How to Use the Calculator and the Comptometer. 4th ed. New York: McGraw-Hill Book Co., Inc., 1959.

________, and Kahn, Gilbert. How to Use Adding Machines. New York: McGraw-Hill Book Co., Inc., 1962.
Instructor's Guide.

Walker, Arthur L.; Reach, J. Kenneth; and Hanna, J. Marshall. How to Use Adding and Calculating Machines. 2d ed. New York: McGraw-Hill Book Co., Inc., 1960.

INTRODUCTION TO BUSINESS DATA PROCESSING

Hours Required

Class: 2 hours daily Total: 60 hours

Description

This orientation unit is designed to promote understanding of the need for and importance of data in different types of businesses and in other fields. It introduces the trainee to the basic data processing cycle and the current systems, methods, and equipment used for rapid handling of large quantities of business data. Basic office filing procedures are also explained and practiced. The application of the basic cycle to manual, mechanical, electro-mechanical, and electronic systems used for various business purposes is explained and demonstrated. Computer fundamentals should be explained but not treated in depth as in the ''Introduction to Computers'' course unit. Stress is placed on the importance of the peripheral data processing functions and the use of associated equipment. Trainees should be given the opportunity to see demonstrations of equipment in operation in the school facility and local business data processing installations.

Topic Outline

I. Importance and Uses of Data
II. Evolution and Growth of Data Processing Systems
III. Applications of Data Processing
IV. Basic Data Processing Cycle
V. Input-Output Data Representation
VI. Introduction to Systems and Equipment
VII. Introduction to Computers
VIII. Peripheral Business Data Processing Occupations

TOPIC I. IMPORTANCE AND USES OF DATA

A. History of record-keeping

B. Sources and types of data

C. Needs for data

D. Decisions based on data

E. Growing complexity of data

TOPIC II. EVOLUTION AND GROWTH OF DATA PROCESSING SYSTEMS

A. Definition of terms: data, data processing, technology, automation, etc.

B. Evolution of data processing systems
  1. Early one-man businesses—simple bookkeeping

2. Expansion of business and increasing need for data
3. Early mechanization of the recordkeeping process
4. Development of office machines
5. Development of punched card systems
6. Integrated data processing
7. Electronic data processing systems
8. Future of data processing

C. Data processing in the business organization

D. Filing techniques
   1. Alphabetic files
   2. Numeric files
   3. Subject files
   4. Other types of files—chronological, geographical, etc.
   5. Indexing and filing rules
   6. Filing procedures and materials
   7. Filing correspondence, printed material, department records
   8. Establishing and maintaining filing systems
   9. Filing practice

TOPIC III. APPLICATIONS OF DATA PROCESSING

A. Engineering

B. Science

C. Statistics

D. Military

E. Financial and banking

F. Business and industry
   1. Accounting
   2. Payroll
   3. Reports
   4. Inventory and material control
   5. Production scheduling
   6. Labor distribution
   7. Sales analysis
   8. Market forecasting
   9. Management forecasting

TOPIC IV. BASIC DATA PROCESSING CYCLE

A. Collection of data (original documents—checks, time cards, etc.)

B. Input preparation and entry (preparing ledger pages, punching cards, etc.)

C. Processing
   1. Classifying (by location, production lot, etc.)
   2. Sorting (by code, account number, etc.)
   3. Calculating (total volume, averages, deductions, etc.)
   4. Summarizing (new or reconstructed data)

D. Storage (machine memory, library, paper files)

E. Output (punched cards, magnetic tape, document, statement)

TOPIC V. INPUT-OUTPUT DATA REPRESENTATION

A. Recording media
   1. Punched cards
   2. Punched paper tape
   3. Magnetic tape
   4. Magnetic ink characters
   5. Printed forms
   6. Cathode-ray tube
   7. Other media

B. Coding systems—man-machine communication

TOPIC VI. INTRODUCTION TO SYSTEMS AND EQUIPMENT

A. Flowcharting

B. Manual

C. Machine
   1. Typewriter
   2. Reproducing machines
   3. Calculator
   4. Accounting machine
   5. Key sort

- D. Electro-mechanical machine functions and types
  - 1. Key-punch
  - 2. Verifier
  - 3. Reproducer
  - 4. Collator
  - 5. Sorter
  - 6. Interpreter
  - 7. Calculator
  - 8. Tabulator
  - 9. Media converter—tape to card, card to tape
- E. Electronic

TOPIC VII. INTRODUCTION TO COMPUTERS

- A. Computer applications
- B. Components and functions of a computer system
- C. Number systems (binary, octal, decimal)
- D. Computer characteristics
- E. Console and inquiry
  - 1. Console function
  - 2. Inquiry function
- F. Programming
  - 1. The programming function
  - 2. Preparing a problem for processing
  - 3. Coding and programming fundamentals

TOPIC VIII. PERIPHERAL BUSINESS DATA PROCESSING OCCUPATIONS

- A. Job functions and associated equipment
  - 1. Tape librarian
  - 2. Coding clerk
  - 3. Key-punch operator
  - 4. Tabulating machine operator
  - 5. Console operator
  - 6. Supervisor, machine records unit
  - 7. Supervisor, clerical
  - 8. Statistical clerk
  - 9. Possible future occupation—peripheral equipment operator
- B. Importance of peripheral business data processing occupations

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Canning, Richard G. Electronic Data Processing for Business and Industry. New York: John Wiley and Sons, Inc., 1956.

________, Installing Electronic Data Processing Systems. New York: John Wiley and Sons, Inc., 1956.

Chapin, Ned. An Introduction to Automatic Computers. 2d ed. Princeton, N. J.: Van Nostrand Co., 1963.

Gotlieb, C. C. and Hume, J. N. P. High-speed Data Processing. New York: McGraw-Hill Book Co., Inc., 1958.

Gregory, Robert H. and Van Horn, Richard L. Automatic Data-Processing Systems. 2d ed. Belmont, Calif.: Wadsworth Publishing Co., 1963.

Freeman, M. Herbert; Hanna, J. Marshall; and Kahn, Gilbert. Gregg Bookkeeping and Accounting. 3d ed. New York: McGraw-Hill Book Co., Inc., 1963. (Contains special section on business data processing.)

Hein, Leonard W. An Introduction to Electronic Data Processing for Business. Princeton, N. J.: D. Van Nostrand Co., 1961.

Johnson, Lloyd E.; Wadsworth, William E.; and Burger, John. Business Automation Fundamentals. San Francisco, Calif.: Automation Institute Publishing Co., 1961.

Kahn, Gilbert; Yerian, Theodore; and Stewart, Jeffry R. Progressive Filing. New York: McGraw-Hill Book Co., Inc., 1961.
Workbook, Practice Materials, Practice Instruction Manual, and other materials.
Kometsky, G. and Kirchner, P. Electronic Computers and Management Control. New York: McGraw-Hill Book Co., Inc., 1956.
Laurie, Edward J. Computers and How They Work. Cincinnati, Ohio: South-Western Publishing Co., 1963.
Leven, Howard S. Office Work and Automation. New York: John Wiley and Sons, Inc., 1956.
Martin, E. Wainright. Electronic Data Processing: An Introduction. Homewood, Ill.: Richard D. Irwin, 1961.
McCracken, D. D.; Weiss, H.; and Lee, T. Programming Business Computers. New York: John Wiley and Sons, Inc., 1959.
McGill, Donald A. C. Punched Cards: Data Processing for Profit Improvement. New York: McGraw-Hill Book Co., Inc., 1962.
Nett, Roger W. and Hetzler, Stanley A. An Introduction to Electric Data Processing. Glencoe, Ill.: Free Press, 1959.
Oakford, Robert V. Introduction to Electronic Data Processing Equipment. New York: McGraw-Hill Book Co., Inc., 1962.
Pfeiffer, John. The Thinking Machine. Philadelphia: J. B. Lippincott Co., 1962.
Wanous, S. J. and Wanous, E. W. Automation Office Practice. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Teachers' Manual. Office Practice Set.
Weeks, Bertha, How to File and Index. New York: The Ronald Press Co., 1956.

ELECTRO-MECHANICAL ACCOUNTING MACHINES

Hours Required

Class: 2 hours daily, Laboratory: 4 hours daily Total: 30 hours

Description

This unit provides an orientation to the principles of electro-mechanical accounting machines as part of an independent system and as support of the computer. Trainees are given an opportunity to study application of the equipment to problems in accounting. They should see each piece of equipment in operation as the functions, features, and operating procedures are explained.

Topic Outline

I. The Punched Card
II. Machine Functions
III. Machine Components
IV. Key Punch and Verifier
V. Interpreter
VI. Sorter
VII. Reproducer

VIII. Collator
IX. Accounting Machine—Tabulator
X. Calculator
XI. Basic Housekeeping Procedures
XII. Equipment Used as Computer Support
XIII. Accounting Applications

TOPIC I. THE PUNCHED CARD

A. The source document

B. Card format

C. Card code

D. Card field

E. Card control functions

F. Card movement in the machines

TOPIC II. MACHINE FUNCTIONS

A. Recording

B. Classifying

C. Calculating

D. Reporting

TOPIC III. MACHINE COMPONENTS

A. Feeding

B. Reading

C. Control panels
  1. Types
  2. Wiring

D. Checking

TOPIC IV. KEY PUNCH AND VERIFIER

A. Functions

B. Features

C. Numeric and alphabetic punching

D. The control card

E. Duplicating

F. Verification

TOPIC V. INTERPRETER

A. Functions

B. Features

C. The column split

D. Interpreting

E. The selector

F. Interpreting with selection

TOPIC VI. SORTER

A. Functions

B. Features

C. Operating procedures

D. Numerical and alphabetic sorting

E. Block sorting

TOPIC VII. REPRODUCER

A. Functions

B. Features

C. Operating procedures

D. Reproducing

E. Gang punching

F. Verifying

TOPIC VIII. COLLATOR

A. Functions

B. Features

C. Operating procedures

D. Sequence checking

E. Selection

F. Merging

G. Matching

TOPIC IX. ACCOUNTING MACHINE—TABULATOR

A. Functions

B. Features

C. Control Panel
  1. Detail printing

  2. Program control
  3. Addition and subtraction
  4. Group printing and group indication
  5. Selective printing
  6. Summary punching

TOPIC X. CALCULATOR

A. Functions

B. Features

C. Control panel
  1. Add
  2. Subtract
  3. Multiply
  4. Divide

TOPIC XI. BASIC HOUSEKEEPING PROCEDURES (Procedures differ with each equipment manufacturer)

TOPIC XII. EQUIPMENT USED AS COMPUTER SUPPORT

A. Data preparation

B. Input function

C. Output function

TOPIC XIII. ACCOUNTING APPLICATIONS

A. Accounts receivable
  1. Functions and objectives
  2. Source documents
  3. Statements and reports
  4. Cards and files
  5. Data processing flow charts

B. Accounts payable
  1. Functions and objectives
  2. Source documents
  3. Checks and reports
  4. Cards and files
  5. Data processing flow charts

C. Payroll
  1. Functions and objectives
  2. Source documents
  3. Statements, checks, reports
  4. Cards and files
  5. Data processing flow charts

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Freeman, M. Herbert; Hanna, J. Marshall; and Kahn, Gilbert. Gregg Bookkeeping and Accounting. 3d ed. New York: McGraw-Hill Book Co., Inc., 1963. (Contains special section on business data processing.)
Practice Sets; Workbooks; Objective Tests; Teacher's Manual and Key; Correlated Series of Six Filmstrips.

IBM Personal Study Program. Punched Card Data Processing Principles. Form #320-1443, 1444, 1445, 1446, 1447, 1448, 1449. 1961.

Irwin, Wayne C. Digital Computer Principles. Princeton, N. J.: D. Van Nostrand Co., 1961.

Johnson, Eldred A. Accounting Systems in Modern Business. New York: McGraw-Hill Book Co., Inc., 1959.

Johnson, Lloyd E.; Wadsworth, William E.; and Burger, John. Business Automation Fundamentals. San Francisco, Calif.: Automation Institute Publishing Co., 1961.

Laurie, Edward J. Computers and How They Work. Cincinnati, Ohio: South-Western Publishing Co., 1963.

McGill, Donald A. C. Punched Cards - Data Processing for Profit Improvement. New York: McGraw-Hill Book Co., Inc., 1962.

Nelson, Oscar S. and Woods, Richard S. Accounting Systems and Data Processing. Cincinnati, Ohio: South-Western Publishing Co., 1961.

Oakford, Robert V., Introduction to Electronic Data Processing Equipment. New York: McGraw-Hill Book Co., Inc., 1962.

Randall, Clarence B.; Weimer, Sally W.; Greenfield, Maynard S. Systems and Procedures for Automated Accounting. Cincinnati, Ohio: South-Western Publishing Co., 1962.

Salman, Lawrence, IBM Machine Operation and Wiring. Belmont, Calif.: Wadsworth Publishing Co., Inc., 1962.
VanNess, Robert G. Principles of Punched Card Data Processing. Elmhurst, Ill.: Business Press, Inc., 1962.

ELEMENTARY DESCRIPTIVE STATISTICS

Hours Required

Class: 1 hour daily, Laboratory: 1 hour daily Total: 60 hours

Description

Designed to provide certain trainees (statistical clerks and supervisors) with basic knowledge and skills required in business applications of elementary descriptive statistics. This course also serves to broaden understanding of routine compilation of data. Statistical theory discussion should be concurrent with the development of proficiency through practice exercises in the laboratory sessions.

Topic Outline

I. The Field of Statistics
II. Organization and Interpretation of Data
III. Graphical Presentation
IV. Measures of Central Tendency
V. Measures of Variability
VI. Frequency Distribution Classifications
VII. Basic Sampling Concepts
VIII. Statistical Reports
IX. Using the Computer for Statistical Analysis (Demonstration)

TOPIC I. THE FIELD OF STATISTICS

A. Statistics defined

B. Origin and history of statistics

C. Growth of statistics in business and industry

D. Sources of statistical data

E. Uses of statistical data

F. Pitfalls in statistics
  1. Bias
  2. Improper sampling
  3. Noncomparative data
  4. Improper assumptions

G. Some modern descriptive statistical methods

TOPIC II. ORGANIZATION AND INTERPRETATION OF DATA

A. Definitions, notations, and symbols

B. Basic rules of computation

C. Class intervals

D. Frequency Distribution
  1. Basic concepts
  2. Grouping
  3. Graphic presentation

E. Tabular presentation
   1. Elements of a table
   2. Rules for construction of a table

TOPIC III. GRAPHICAL PRESENTATION

A. Types of graphs

B. Histograms

C. Pictograms

D. Frequency polygons

E. Cumulative distributions and ogives

TOPIC IV. MEASURES OF CENTRAL TENDENCY

A. The arithmetic mean
   1. Ungrouped data
   2. Grouped data

B. The median
   1. Ungrouped data
   2. Grouped data

C. The mode

D. The weighted arithmetic mean

E. The geometric mean

F. Quartiles, deciles, and percentiles

TOPIC V. MEASURES OF VARIABILITY

A. The range

B. The average deviation

C. The standard deviation
   1. Ungrouped data
   2. Grouped data

TOPIC VI. FREQUENCY DISTRIBUTION CLASSIFICATIONS

A. Normal distribution

B. Skew

C. Other types of frequency distribution (optional)

D. Transformation of data

TOPIC VII. BASIC SAMPLING CONCEPTS

A. Random sampling

B. Stratified sampling

C. Proportional sampling

D. Size of sample

TOPIC VIII. STATISTICAL REPORTS

A. Need for statistical reports in business

B. Types of reports

C. Preparation and processing of reports

TOPIC IX. USING THE COMPUTER FOR STATISTICAL ANALYSIS (DEMONSTRATION)

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Croxton, F. E. and Cowden, D. J. Applied General Statistics. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1955.

Freund, John E. and Williams, Frank J. Modern Business Statistics. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1958.

Johnson, Palmer O. and Jackson, Robert W. B. Introduction to Statistical Methods. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1953.

Lewis, Edward E. Methods of Statistical Analysis in Economics and Business. Boston: Houghton Mifflin Co., 1953.

McCarthy, Philip J. Introduction to Statistical Reasoning. New York: McGraw-Hill Book Co., Inc., 1957.

Mode, E. B. Elements of Statistics. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1951.

Mood, Alexander M. and Graybill, Franklin A. Introduction to the Theory of Statistics. New York: McGraw-Hill Book Co., Inc., 1963.

Mosteller, F.; Rourke, R. E. K.; Thomas, G. B., Jr. Probability and Statistics. Reading, Mass.: Addison Wesley Publishing Co., 1961.

Paden, Donald W. and Lindquist, E. F. Statistics for Economics and Business. 2d ed. New York: McGraw-Hill Book Co., Inc., 1956.
Workbook.

Riggleman, John R. and Frisbee, Ira N. Business Statistics, 3d ed. New York: McGraw-Hill Book Co., Inc., 1951.

Sprowls, R. Clay. Elementary Statistics. New York: McGraw-Hill Book Co., Inc., 1955.

Tuttle, Alva M. Elementary Business and Economic Statistics. New York: McGraw-Hill Book Co., Inc., 1957.
Laboratory Manual.

Walker, Helen M. and Lev, Joseph. Elementary Statistical Methods. New York: Henry Holt & Co., 1958.

Wallis, W. A. and Roberts, H. V. Statistics: A New Approach. Glencoe, Ill.: The Free Press, 1956.

Waugh, A. E. Elements of Statistical Method. 3d ed. New York: McGraw-Hill Book Co., Inc., 1952.
Statistical Tables and Problems

Wolf, Frank L. Elements of Probability and Statistics. New York: McGraw-Hill Book Co., Inc., 1962.

PRINCIPLES OF SUPERVISION

Hours Required

Class: 1 hour daily Total: 30 hours

Description

In this unit the trainee should gain an understanding of good supervisory principles and practices in the office. Attention in the unit is centered on the responsibilities of supervision and developing good relationships with office employees. Core activities should include the techniques of face-to-face communication, assigning employees, delegating authority and responsibility, and the orientation and training of new employees. The teacher should take every opportunity to use role playing techniques to develop trainee skills and case discussions to widen understanding. Cases, role plays, discussions, and problems should focus on office work situations.

Topic Outline

I. The Function of Management
II. The Supervisory Job: General Responsibilities
III. Communicating with Employees
IV. Interviewing
V. Evaluating Employees
VI. Other Factors Affecting Supervision

TOPIC I. THE FUNCTION OF MANAGEMENT

A. Major responsibilities in planning and controlling

B. Nature of office supervision

C. Supervisory authority and responsibility
  1. Authority and responsibility defined
  2. Final accountability for actions
  3. Relationship with superiors

TOPIC II. THE SUPERVISORY JOB: GENERAL RESPONSIBILITIES

A. Participating in the selection and placement of office employees
  1. Cooperating with personnel department
  2. Interviewing prospective employees
  3. Evaluating abilities of prospective employees

B. Indoctrinating and training employees
  1. Newly hired employees
  2. How to determine training needs
  3. How to train

C. Organizing the work of the section

D. Obtaining quality work from others

E. Developing the employee's capacities and interests effectively

F. Reviewing and evaluating the work performance of employees

G. Utilizing effective human relations to achieve teamwork and harmony

H. Improving work methods

I. Increasing the value of employees

J. Participation in the formation of objectives
  1. Departmental
  2. Sectional
  3. Personal

K. Keeping personnel records

TOPIC III. COMMUNICATING WITH EMPLOYEES

A. Communicating changes in work methods

B. Communicating changes in policies and procedures

C. Communicating orders

TOPIC IV. INTERVIEWING

A. Some interviewing techniques

B. Interviewing technique practice (role play)

TOPIC V. EVALUATING EMPLOYEES

A. Appraising employees and prospective employees

B. Disciplining employees

C. Rewarding employees

TOPIC VI. OTHER FACTORS AFFECTING SUPERVISION

A. Union contracts

B. Problem employees

C. Accepting supervisory responsibilities

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher material for use in this unit. Additional references are listed in Appendix B.

Brown, Milon. Effective Supervision. New York: The Macmillan Co., 1956.

Cooper, Alfred M. How to Supervise People. 4th ed. New York: McGraw-Hill Book Co., Inc., 1958.

Dorcus, Roy M. and Jones, Margaret Hubbard. Handbook of Employee Selection. New York: McGraw-Hill Book Co., Inc., 1950.

Famularo, Joseph J. Supervisors in Action—Developing Your Skills in Managing People. New York: McGraw-Hill Book Co., Inc., 1961.
Halsey, George D. Supervising People. New York: Harper & Bros., 1953.
Kay, Brian R. and Palmer, Stuart. The Challenge of Supervision. New York: McGraw-Hill Book Co., Inc., 1961.
Laird, Donald A. and Eleanor C. Practical Business Psychology. 3d ed. New York: McGraw-Hill Book Co., Inc., 1961.
________. Sizing up People. New York: McGraw-Hill Book Co., Inc., 1951.
________, The Techniques of Delegating. New York: McGraw-Hill Book Co., Inc., 1951.
Nichols, Ralph G. and Stevens, Leonard A. Are You Listening? New York: McGraw-Hill Book Co., Inc., 1957.
Neuner, John J. W. Office Management. 4th ed. Cincinnati, Ohio: South-Western Publishing Co., 1959.
Newton, Roy and Green, Helen. How to Improve Your Personality. 3d ed. New York: McGraw-Hill Book Co., Inc., 1963.
Sferra, Adam; Wright, Mary Elizabeth; and Rice, Louis A. Personality and Human Relations. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.
Terry, George R. Office Management and Control. 3d ed. Homewood, Ill.: Richard D. Irwin, Inc., 1958.

PSYCHOLOGY FOR SUPERVISORS

Hours Required

Class: 1 hour daily Total: 30 hours

Description

This unit is designed for those who will supervise others in an office environment. It is an introduction to the understanding of interpersonal relationships, personality, morale, personal efficiency, and leadership as they relate to office work climate and productivity. Trainee participation should be maximized by the employment of case studies, discussion, and role-playing, as they pertain to office situations.

Topic Outline

I. Human Relations and Morale
II. Personality and Emotional Health
III. Improving Personal Efficiency
IV. Personal Leadership

TOPIC I. HUMAN RELATIONS AND MORALE

A. Human relationships
   1. Dimensions of human relations
      a. Psychological
      b. Social
   2. In personal situations
   3. In business situations

B. Human relations' influence on morale
   1. Effect of morale in the work situation
   2. Enhancement of morale
   3. Deterioration of morale and hostilities
   4. Value of praise

C. Specific human relations situations
   1. At time of interview
   2. In meeting and working with new people
   3. In sustaining good work relationships
   4. In handling "problem" situations

TOPIC II. PERSONALITY AND EMOTIONAL HEALTH

A. The mature personality
   1. Key characteristics
   2. Development

B. The mature personality in business life
   1. Responding to new demands and environment
   2. Assuming responsibility for handling problems

TOPIC III. IMPROVING PERSONAL EFFICIENCY

A. Identification of job responsibilities
   1. Planning appropriate work schedules
   2. Organizing work
   3. Following through on plans

B. Maintenance of physical efficiency
   1. Planning for adequate rest and recreation
   2. Understanding other physical needs of people

TOPIC IV. PERSONAL LEADERSHIP

A. Levels of leadership responsibility

B. Development of leadership skills
   1. In small group situations
   2. In large group situations
   3. In supervisory positions

C. Rewards of good leadership

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Becker, Esther. Success and Satisfaction in Your Office Job. New York: Harper and Bros., 1954.

Davis, Keith. Human Relations in Business. New York: McGraw-Hill Book Co., Inc., 1957.

Gardner, Burleigh and Moore, David. Human Relations in Industry. Homewood, Ill.: Richard D. Irwin Publishing Co., 1955.

Laird, Donald A. and Eleanor C. Practical Business Psychology. 3d ed. New York: McGraw-Hill Book Co., Inc., 1961.
Tests.

________, The Techniques of Delegating. New York: McGraw-Hill Book Co., Inc., 1957.

Lawshe, C. H., Jr. The Psychology of Industrial Relations. New York: McGraw-Hill Book Co., Inc., 1953.
Six filmstrips, three records, correlated with this text.

Russon, Allien. Business Behavior. Cincinnati, Ohio: South-Western Publishing Co., 1964.

CLASSIFICATION AND CODING

Hours Required

Class: 1 hour daily, Laboratory: 1 hour daily Total: 60 hours

Description

Emphasis in this unit is on coding skill development. The trainee learns various types of coding systems and should develop a basic understanding of programming and data processing system material preparation. Since some of this material would have been covered in the unit, Introduction to Business Data Processing, instructors should use minimum time for refreshing trainee and concentrate on practice experiences.

Topic Outline

I. Fundamentals of Program Preparation
II. Coding Systems and Coding Practice
III. Flow Charts and Block Diagrams
IV. Elements of Data Processing Systems
V. Types of Computers
VI. Number Systems
VII. Computer Words and Practice Coding
VIII. Computer Address System
IX. Fundamentals of Coding Digital Computers

TOPIC I. FUNDAMENTALS OF PROGRAM PREPARATION

A. Definition and analysis

B. Elements of program design

C. Coding

D. Testing

TOPIC II. CODING SYSTEMS AND CODING PRACTICE

A. Classification codes
  1. Alphabetic
  2. Numeric
  3. Alpha-numeric
  4. Mnemonic

B. Machine language and communication codes
  1. Punched tape (5, 6, 7, 8 channel codes)
  2. Punched card (80 col., 90 col.)
  3. Magnetic tape (5, 6, 7, 8 channel codes)
  4. Character recognition

C. Coding sheet forms

TOPIC III. FLOW CHARTS AND BLOCK DIAGRAMS

A. Types

B. Symbols

C. Organization

TOPIC IV. ELEMENTS OF DATA PROCESSING SYSTEMS

A. Input-Output

B. Storage

C. Processing

D. Control

TOPIC V. TYPES OF COMPUTERS

A. Analog

B. Digital

C. General purpose

D. Special purpose

TOPIC VI. NUMBER SYSTEMS

A. Binary

B. Octal

C. Binary arithmetic

D. Conversion of bases

TOPIC VII. COMPUTER WORDS AND PRACTICE CODING

A. Data words

B. Instruction words

TOPIC VIII. COMPUTER ADDRESS SYSTEM

A. Concept of address system

B. Types of systems

TOPIC IX. FUNDAMENTALS OF CODING DIGITAL COMPUTERS

A. Input-output commands

B. Arithmetic operations

C. Decision-making

D. Editing

E. Loops and indexing

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Chapin, Ned. Programming Computers for Business Applications. New York: McGraw-Hill Book Co., Inc., 1961.

Evans, G. W. and Perry, C. L. Programming and Coding for Automatic Digital Computers. New York: McGraw-Hill Book Co., Inc., 1961.

Galler, Bernard A. The Language of Computers. New York: McGraw-Hill Book Co., Inc., 1962.

Gotlieb, C. C. and Hume, J. N. P. High-speed Data Processing. New York: McGraw-Hill Book Co., Inc., 1958.

Gregory, Robert H. and Van Horn, Richard L. Automatic Data-Processing Systems. 2d ed. Belmont, Calif.: Wadsworth Publishing Co., 1963.

Hein, Leonard W. An Introduction to Electronic Data Processing for Business. Princeton, N. J.: D. Van Nostrand Co., 1961.

Jeenel, Joachim. Programming for Digital Computers. New York: McGraw-Hill Book Co., Inc., 1959.

Johnson, Lloyd E.; Wadsworth, William E.; and Burger, John. Business Automation Fundamentals. San Francisco, Calif.: Automation Institute Publishing Co., 1961.

Laurie, Edward J. Computers and How They Work. Cincinnati, Ohio: South-Western Publishing Co., 1963.

McCormick, E. M. Digital Computer Primer. New York: McGraw-Hill Book Co., Inc., 1959.

McCracken, D. D.; Weiss, H.; and Lee, T. Programming Business Computers. New York: John Wiley and Sons, Inc., 1959.

Nathan, Robert and Hanes, Elizabeth. Computer Programming Handbook. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962.

Nelson, Oscar S. and Woods, Richard S. Accounting Systems and Data Processing. Cincinnati, Ohio: South-Western Publishing Co., 1961.

Oakford, Robert V. Introduction to Electronic Data Processing Equipment. New York: McGraw-Hill Book Co., Inc., 1962.

Sherman, Philip M. Programming and Coding Digital Computers. New York: John Wiley and Sons, Inc., 1963.

Siegel, Paul. Understanding Digital Computers. New York: John Wiley and Sons, Inc., 1961.

Wanous, S. J. and Wanous, E. W. Automation Office Practice. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Teachers' Manual. Office Practice Set.
Williams, Samuel B. Digital Computing Systems. New York: McGraw-Hill Book Co., Inc., 1959.

- In addition, references, equipment manuals, and instructional aids are available from local representatives of most data processing equipment manufacturers. The following examples are appropriate for use with this unit.

IBM Form Number	Title
F22-6517	Introduction to IBM Data Processing Systems
F20-8093	Coding Methods
J22-6690	Binary Coded Decimal Code for 1401-1410-7040-7044
A24-3067	1407-1460 System Operators Reference Manual
A24-3068	Misc. Input/Output Instructions for 1401-1460
A24-3069	Tape Input/Output Instructions
A24-3070	Disc Storage Input/Output Instructions
G24-1477	1401 Data Flow
J22-6690	Standard BCD Interchange Code
C24-1480	1401 Symbolic Programming System
C24-1486	1401 Autocoder with 1311 Storage Drives
J24-1434	Autocoder for the 1401
F28-8053	COBOL
C24-1464	FARGO
J24-0215	Report Program Generator
C24-1494	1401 System Programmer's Guide
F28-8074	FORTRAN

Burroughs Corp. Form Number	System	Title or Description
200-20002-D	B 200	Student Workbook—Sales Training
200-21001-D	B 200	Reference Manual
200-21006-D	B 200	Instruction List—Card
MSSG	B 200	Revisions & Additions to B200 Reference Manual
MSSG	B 200	B200 Assembler-Compiler
CHIDO	B 250	Financial Programming Hints

INTRODUCTION TO COMPUTERS

Hours Required

Class: 1 hour daily Total: 30 hours

Description

This unit provides trainees, whose job functions will be closely involved with computer operation, with greater in-depth knowledge of the computer than was given in the orientation unit, "Introduction to Business Data Processing." The teacher should treat certain topics in this unit as "refresher" material. Other topics such as computer characteristics, functions, processing, and programming should be given greater attention and emphasis.

Topic Outline

I. Computer Applications
II. Computer Characteristics
III. Components and Functions of a Computer System
IV. Input-Output Media
V. Central Processing Unit
VI. Internal Processing
VII. Console and Inquiry
VIII. Programming

TOPIC I. COMPUTER APPLICATIONS

A. Commercial and financial

B. Scientific

C. Process control

D. Numerical control

E. Planning and simulation

F. Communications

TOPIC II. COMPUTER CHARACTERISTICS

A. Analog and digital

B. Serial and parallel

C. Buffered and unbuffered

D. Sequential and random

E. Numeric and alphanumeric

F. Variable and fixed

TOPIC III. COMPONENTS AND FUNCTIONS OF A COMPUTER SYSTEM

A. Input-Output

B. Storage

C. Logic

D. Arithmetic

E. Control

TOPIC IV. INPUT-OUTPUT MEDIA

A. Card devices

B. Magnetic tape unit

C. Paper tape devices

D. Magnetic character sensing

E. Optical reader

F. Printers

G. Random access devices

H. Console

TOPIC V. CENTRAL PROCESSING UNIT

A. Storage unit or memory
   1. Purpose
   2. Types of storage
   3. Data representation in storage

B. Arithmetic

C. Logic

D. Control

TOPIC VI. INTERNAL PROCESSING

A. Loading the stored program

B. Accessing

C. Registers

D. Data flow

TOPIC VII. CONSOLE AND INQUIRY

A. Console function

B. Inquiry function

TOPIC VIII. PROGRAMMING

A. Program preparation steps

B. Types of instruction

C. Coding

D. Flow charting and block diagraming

E. Number systems

F. Address systems

G. Computer word format

H. Housekeeping

I. Running

J. Error correction

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Bell, W. D. A Management Guide to Electronic Computers. New York: McGraw-Hill Book Co., Inc., 1957.

Canning, Richard G. Electronic Data Processing for Business and Industry. New York: John Wiley and Sons, Inc., 1956.

Chapin, Ned. An Introduction to Automatic Computers. Princeton, N. J.: D. Van Nostrand Co., 1963.

Fahnestock, James D. Computers and How They Work. New York: Ziff-Davis Publishing Co., 1960.

Gotlieb, C. C. and Hume, J. N. P. High-speed Data Processing. New York: McGraw-Hill Book Co., Inc., 1958.

Grabbe Eugene M., ed. Automation in Business and Industry. New York: John Wiley and Sons, Inc., 1957.

Irwin, Wayne C. Digital Computer Principles. Princeton, N. J.: D. Van Nostrand Co., 1961.

Hein, Leonard W. An Introduction to Electronic Data Processing for Business. Princeton, N. J.: D. Van Nostrand Co., 1961.

Jeenel, Joachim. Programming for Digital Computers. New York: McGraw-Hill Book Co., Inc., 1959.

Johnson, Eldred A. Accounting Systems in Modern Business. New York: McGraw-Hill Book Co., Inc., 1959.

Laurie, Edward J. Computers and How They Work. Cincinnati, Ohio: South-Western Publishing Co., 1963.

Ledley, Robert S. Programming and Utilizing Digital Computers. New York: McGraw-Hill Book Co., Inc., 1962.

Leeds, Herbert D. and Weinberg, Gerald M. Computer Programming Fundamentals. New York: McGraw-Hill Book Co., Inc., 1961.

Livesley, R. K. An Introduction to Automatic Digital Computers. New York: Cambridge University Press, 1962.

Martin, E. Wainright. Electronic Data Processing. Homewood, Ill.: Richard D. Irwin, Inc., 1961.

McCormick, E. M. Digital Computer Primer. New York: McGraw-Hill Book Co., Inc., 1959.

McCracken, D. D.; Weiss, H.; and Lee, T. Programming Business Computers. New York: John Wiley and Sons, Inc., 1959.

Murphy, John S. Basics of Digital Computers. New York: John F. Rider Publisher, Inc., 1958.

Nett, Roger W. and Hetzler, Stanley A. An Introduction to Electric Data Processing. Glencoe, Ill.: Free Press, 1959.

Oakford, Robert V. Introduction to Electronic Data Processing Equipment. New York: McGraw-Hill Book Co., Inc., 1962.

Pfeiffer, John. The Thinking Machine. Philadelphia: J. B. Lippincott Co., 1962.

Postley, John A. Computers and People. New York: McGraw-Hill Book Co., Inc., 1960.

Richards, R. K. Digital Computer Components and Circuits. Princeton, N. J.: D. Van Nostrand Co., 1957.

Sherman, Philip M. Programming and Coding Digital Computers. New York: John Wiley and Sons, Inc., 1963.

Siegel, Paul. Understanding Digital Computers. New York: John Wiley and Sons, Inc., 1961.

Williams, Samuel B. Digital Computing Systems. New York: McGraw-Hill Book Co., Inc., 1959.

SPECIALIZED OCCUPATION UNITS

CODING CLERK

Job Description **D. O. T. No. 1-36.05**

Converts items of information obtained from reports and records to codes for processing on automatic machines, using predetermined coding system. Records codes onto form for subsequent transfer to punchcards. May be designated according to trade name of computer system.

Prerequisites

For Occupation

Work situations involve repetitive activities performed according to set procedures. The coding clerk must work to established standards of accuracy in assigning codes. Since coding is performed according to a predetermined, standardized system, a preference for activities of a routine, concrete, organized nature is preferred. Clerical perception is required in converting data to codes, recognizing omissions, and correcting errors in data used.

For Occupational Course of Study

The occupational unit for this trainee is included under the General Office Education Units. Appropriate units for this trainee are listed below.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Language Skills	30
Personal Development	30
Business Principles and Organization I	30
Introduction to Business Data Processing	60
Classification and Coding	60
Introduction to Computers	30
Electro-Mechanical Accounting Machines	30

STATISTICAL CLERK

Job Description D. O. T. No. 1-36.01

Compiles regular and special reports for the use of management and as a basis for statistical studies, using the regular bookkeeping and accounting records as a source of information. Makes up reports showing information such as amount and type of material ordered, used, and rejected; volume and class of daily sales; number and kind of accumulative pending sales, and average working time and wage rate of company employees. May check material used as a source of information. May operate an adding machine and a calculating machine.

Prerequisites

For Occupation

The statistical clerk works under specific instructions, carrying out set procedures and adhering to established standards of accuracy. The trainee should have a preference for activities of a routine, concrete, organized nature.

Clerical perception is required to perceive pertinent detail in written and tabular material, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. Form perception is needed to make visual discriminations and comparisons in graphic material. Good visual acuity is required for working with figures, tables, graphs, and written reports.

Numerical aptitude is required to perform arithmetic operations quickly and accurately. Verbal ability is required to understand instructions and to present information clearly.

Since the statistical clerk may operate an adding machine or a calculating machine, motor coordination and finger and manual dexterity are needed.

For Occupational Course of Study

The occupational unit for this trainee is included under the General Office Education Units. Appropriate units for this trainee are listed below.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Payroll Records	30
Language Skills	30
Personal Development	30
Business Principles and Organization I	30
Business Principles and Organization II	30
Office Calculators	30
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Elementary Descriptive Statistics	60

TAPE LIBRARIAN

Job Description **D. O. T. No. 1-20.04**

Maintains library of reels of magnetic or punched paper tape used for automatic data processing purposes. Classifies and catalogs reels of tape in accordance with such factors as content of data and type of routine. Assigns code conforming with standardized system. Prepares records for file reference. Stores reels according to classification and catalog designation. Issues reels and maintains charge-out records. Inspects returned reels to determine if tape needs replacing due to wear or damage.

Prerequisites

For Occupation

The activities require performance according to specific procedures. Therefore, the tape librarian should have a preference for activities of a routine, concrete, organized nature.

The work is light, requiring frequent lifting and placing reels of tape (20 pounds reel weight lifted occasionally). Reaching and handling are required to store, issue, and wind reels.

Other requirements are verbal ability to deal with subject matter and clerical ability to perceive pertinent details involved in assigning catalog numbers and classifying reels of tape.

For Occupational Course of Study

As a prerequisite for entering the occupational course the trainee should have skills and knowledge equivalent to that gained from the General Office Education Units suggested as pertinent to this occupation.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Language Skills	30
Business Communications	30
Personal Development	30
Business Principles and Organization I	30
Fundamentals of Typing	60
Production Typing	60
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Specialized Occupation Unit which follows:	
Elementary Library Systems	60

ELEMENTARY LIBRARY SYSTEMS

Hours Required

Class: 1 hour daily, Laboratory: 1 hour daily Total: 60 hours

Description

This unit serves to acquaint trainees with procedures and methods used in maintaining a tape library. Elementary systems for identification and control of stored materials are detailed. Each class of library materials is discussed in terms of the factors which affect its receipt, storage, and issue. Emphasis is on developing skill in originating and maintaining basic tape library records.

Topic Outline

I. The Library in the Organization
II. Factors in Organizing Storage of Library Materials
III. Storing Tapes, Cards, and Materials
IV. Record Systems
V. Classification Systems
VI. The Program Library
VII. Simulation of Setting up a Library

TOPIC I. THE LIBRARY IN THE ORGANIZATION

A. Library services

B. The job of the librarian

C. Advances in library technology

D. Integrating the library with the total data processing system

E. Data processing materials

TOPIC II. FACTORS IN ORGANIZING STORAGE OF LIBRARY MATERIALS

A. Size and types of storage space—racks, cabinets, containers

B. Types of supplies needed—tapes, reels, etc.

C. Receipt, storage, and issue of materials

TOPIC III. STORING TAPES, CARDS, AND MATERIALS

A. Factors in handling magnetic tape
   1. Properties, size, data representation
   2. Temperature and humidity conditions
   3. Tape reconditioning
   4. Cycling tapes in the library
   5. Protective handling
   6. Packing and shipping
   7. Checking for damage
   8. Cleaning
   9. Testing

B. Punched paper tape

C. Cards

D. Other materials

E. Practice in handling stored materials

TOPIC IV. RECORD SYSTEMS

A. Purpose of and need for accurate record systems

B. Types of systems

C. Record formats

D. Records for file references

E. Records for issue and receipt

F. Scratch dates

G. Practice in library clerical activity

TOPIC V. CLASSIFICATION SYSTEMS

A. Purposes of classification

B. Classification systems

C. Process of classification
  1. By content of data
  2. By type of routine

D. Classification of varied types of materials
  1. Magnetic tapes
  2. Punched paper tape
  3. Punched cards
  4. Other materials

E. Labeling Magnetic tapes
  1. Label formats
  2. Types of information needed on labels
  3. External labels
  4. Internal labels

F. Practice in classifying and labeling

TOPIC VI. THE PROGRAM LIBRARY

A. Classification and control of materials
  1. Program card decks
  2. Program master tapes
  3. Utility programs
  4. Subroutines
  5. Control panels
  6. Printer carriage control tapes

TOPIC VII. SIMULATION OF SETTING UP A LIBRARY

(Practice on all library activities)

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Gotlieb, C. C. and Hume, J. N. P. High-Speed Data Processing. New York: McGraw-Hill Book Co., Inc., 1958.

McCracken, Daniel D. Digital Computer Programming. New York: John Wiley and Sons, Inc., 1957.

Nathan, Robert and Hanes, Elizabeth. Computer Programming Handbook. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962.

Randall, C. B.; Weimer, S. W.; and Greenfield, M. S. Systems and Procedures for Automated Accounting. Cincinnati, Ohio: South-Western Publishing Co., 1962.

In addition, references, equipment manuals, and instructional aids are available from local representatives of most data processing equipment manufacturers. The following examples are appropriate for use with this unit.

IBM Form Number	Title
F20-6088	Planning for an IBM System
F22-6517	Introduction to IBM System
520-1715	Care and Handling of Magnetic Tape
520-1598	Testing and Care of IBM Cards

Burroughs Corp.

Form Number	System	Title or Description
200-21005-D	B 200	Magnetic Tape Sort Generator I—Preliminary Information
703-20001-D	P 703	Amount and Account Number Encoder—Brochure
20008-D		Survey of Modern Programming Techniques—Reprint
200-21003-D	B 200	A Brief Description of Report Generator I

KEY-PUNCH OPERATOR

Job Description **D. O. T. No. 1-25.62**

Records accounting and statistical data on tabulating cards by punching a series of holes in the cards in a specified sequence, using a punch machine similar in operation and action to a typewriter. Places card on base of machine by hand or automatically by pressing a lever, and positions carriage for perforating operation. Following written information on records, punches corresponding numbers or symbols on the machine keyboard, thereby transcribing the written information into perforations on the tabulating cards. May operate a tabulating machine, a sorting machine, or a verifying machine.

Prerequisites

For Occupation

The worker must adhere to established standards of accuracy when recording data. Good visual acuity is required to type data rapidly and continuously.

Clerical perception is required to detect errors in recorded data. Recording of data on cards for machine tabulation requires an adjustment to a routine, concrete, organized type of activity.

For Occupational Course of Study

As a prerequisite for entering the occupational course the trainee should have skills and knowledge equivalent to that gained from the General Office Education Units suggested as pertinent to this occupation.

In order to learn key-punch operation, the trainee must have a typing speed of approximately 40 wpm at the time of entry into the specialized course. Reaching, handling, motor coordination, and finger and manual dexterity are involved in operating the keyboard and inserting material into and removing material from the machine.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Language Skills	30
Business Communications	30
Personal Development	30
Business Principles and Organization I	30
Business Principles and Organization II	30
Fundamentals of Typing	60
Production Typing	60
Office Calculators	30
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Specialized Occupation Unit which follows:	
Key-Punch Equipment Operation	60

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KEY-PUNCH EQUIPMENT OPERATION

Hours Required

Class: 2 hours daily, Laboratory: 4 hours daily Total: 60 hours

Description

This unit is designed to familiarize trainees with the function and operation of key-punch and verifying machines. Emphasis on practice exercises is required to develop speed and accuracy in standard operating procedures to meet employable proficiency standards.

Topic Outline

I. The Unit Record
II. Basic Key-Punch Machine Features and Functions
III. Operating Procedure Practice
IV. Additional Features of the Key-Punch Machine
V. Operating Procedure Practice—Entire Keyboard
VI. Program Control Unit
VII. Program Card and Programming
VIII. Program Control Exercises
IX. Verifying Procedures and Practice

TOPIC I. THE UNIT RECORD

A. Source document

B. Card format

C. Card code

D. Card field

E. Control punches

TOPIC II. BASIC KEY-PUNCH MACHINE FEATURES AND FUNCTIONS

A. Main line switch

B. Hopper

C. Stacker

D. Punching Stations

E. Keyboards
  1. Numeric
  2. Combination (Numeric-alphabetic)

F. Feeding mechanism

G. Reading station

H. Backspace key

I. Column indicator

J. Pressure roll release lever

K. Program unit

TOPIC III. OPERATING PROCEDURE PRACTICE

A. Practice keyboard exercises

B. Simple feeding operations

TOPIC IV. ADDITIONAL FEATURES OF THE KEY-PUNCH MACHINE

A. Auxiliary duplication device

B. Self-checking numbers device

C. Alternate programming

D. Card insertion device

E. Interspersed master card gang punching

F. Card correction feature

TOPIC V. OPERATING PROCEDURE PRACTICE—ENTIRE KEYBOARD

Practice exercises using all key-punch features

TOPIC VI. PROGRAM CONTROL UNIT

- A. Function of the program unit
- B. Program card codes

TOPIC VII. PROGRAM CARD AND PROGRAMMING

- A. Field definition
- B. Numeric or alphabetic shift
- C. Automatic shift
- D. Automatic skipping
- E. Duplication
- F. Zero print
- G. Print suppression

TOPIC VIII. PROGRAM CONTROL EXERCISES

Practice exercises using all program control elements

TOPIC IX. VERIFYING PROCEDURES AND PRACTICE

- A. The need for verifying
- B. Visual verification procedures—listing, printing, proofreading
- C. Visual verification practice
- D. Verifier features and functions
  - 1. Verifying station
  - 2. Keyboard
  - 3. Error light
  - 4. Operating procedures
- E. Practice in verifier use

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available materials), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

McGill, Donald A. C. Punched Cards—Data Processing for Profit Improvement. New York: McGraw-Hill Book Co., Inc., 1962.

Van Ness, Robert G. Principles of Punched Card Data Processing. Elmhurst, Ill.: The Business Press, 1963.

TABULATING MACHINE OPERATOR

Job Description **D. O. T. No. 1-25.64**

Operates a machine that automatically analyzes, makes calculations, and translates or divides information represented by holes punched in groups of tabulating cards, and prints the translated data on form sheets, reports, special cards, or accounting records. Sets or adjusts machine to add, subtract, multiply, and make other calculations. Places cards to be tabulated in feed magazine and starts machine. May file cards after they are tabulated. May sort punched cards, punch information on cards, or verify punched cards.

Prerequisites

For Occupation

The tabulating machine operator trainee should show a preference for working with machines, processes, and techniques, and for activities that are routine and concrete. Motor coordination and finger and manual dexterity are required to wire control panels and operate machines, and use the typewriter.

Other requirements are good vision and clerical perception for error detection in printing and format, and form perception for operating the machine and following wiring diagram details. Some mechanical ability is advantageous.

For Occupational Course of Study

As a prerequisite for entering the occupational course the trainee should have skills and knowledge equivalent to that gained from the General Office Education Units suggested as pertinent to this occupation.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Payroll Records	30
Language Skills	30
Personal Development	30
Business Principles and Organization I	30
Business Principles and Organization II	30
Office Calculators	30
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30

Specialized Occupation Units which follow:

Tabulating Machine Operation	45
Tabulating Machine Wiring	45

TABULATING MACHINE OPERATION

Hours Required

Class: 1 hour daily, Laboratory: 2 hours daily Total: 45 hours

Description

This unit is designed to acquaint trainees with the functions and features of tabulating machines. Extensive practice in operating procedures is required to assure development of proficiency. Since features vary in different models, it is essential that the instructor concentrate on those features common to most tabulating equipment and show or relate some of the differences which are found.

Topic Outline

I. Functions
II. Operating Features
III. Tape-Controlled Carriage
IV. Form control
V. Operating Procedure Practice

TOPIC I. FUNCTIONS

A. Detail printing (listing)

B. Group printing

C. Addition and subtraction

D. Accumulating

E. Program control

F. Summary punching

TOPIC II. OPERATING FEATURES

A. Control panel

B. Signal lights

C. Hopper

D. Stacker

E. Print unit

F. Reading stations

G. Operating keys and switches

H. Hammerlock levers

I. Hammersplit levers

TOPIC III. TAPE CONTROLLED CARRIAGE

A. Carriage controls

B. Control tape

C. Form thickness adjustment

D. Form stops

E. Pressure release lever

F. Platen shift wheel

TOPIC IV. FORM CONTROL

A. Carriage skips

B. Head control

C. Form to form skipping

D. Overflow skipping

E. Program skipping

TOPIC V. OPERATING PROCEDURE PRACTICE

A. Card handling

B. Operating the machine

C. Operating the carriage

D. Exercises in all machine functions (detail printing, etc.)

Texts and Other Teaching Materials

From the following suggested text and material (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Wanous, S. J. and Wanous, E. W. Automation Office Practice. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Teachers' Manual. Office Practice set.

TABULATING MACHINE WIRING

Hours Required

Class: 1 hour daily, Laboratory: 2 hours daily Total: 45 hours

Description

This unit serves to acquaint trainees with control panel wiring principles and procedures. Practice in wiring and in wiring control board replacement for the various applications is essential for the development of proficiency.

Topic Outline

I. Principles of Control Panel Wiring
II. Wiring Fundamentals
III. Wiring Practice

TOPIC I. PRINCIPLES OF CONTROL PANEL WIRING

A. Function of control panel

B. Applications

C. Report formats

TOPIC II. WIRING FUNDAMENTALS

A. Printing
  1. Normal printing
  2. Transfer printing
  3. Character emitting
  4. Zero printing

B. Selection
  1. Pilot selector
  2. Co-selector

C. Program control

D. Addition

E. Subtraction

F. Storage units

G. Summary punching

TOPIC III. WIRING PRACTICE

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Data Processing Wiring Guide. Detroit Mich.: American Data Processing, Inc., 1962.
Solmon, Lawrence J. IBM Machine Operation and Wiring. Belmont, Calif.: Wadsworth Publishing Co., 1962.

A sufficient number of wiring panels should be provided so that certain phases of this course can be taught using the battery plan of instruction.

CONSOLE OPERATOR

Job Description **D. O. T. No. 1-25.17**

Monitors and controls an electronic computer that automatically processes data to solve mathematical, engineering, or technical problems or to maintain business records, by operating a central control unit known as a console. Studies program instruction sheet to determine equipment set-up and operating instructions. Mounts reels of tape in designated magnetic tape units which extract input data or record output data. Switches auxiliary equipment, such as automatic typewriter and peripheral machines into circuit, to close loop and effect feedback of data. Manipulates up to 100 or more control switches on console panel to start and operate electronic computer that reads and processes data. Observes continuously as many as 200 lights on control panel and magnetic tape units and action of automatic typewriter to monitor system and determines point of equipment failure. Tears printed sheets from typewriter at designated points to be used for verification. Reports machine malfunctioning to supervisor. Manipulates controls in accordance with standard procedures to rearrange sequence of program steps in order to correct computational errors or to continue operations when individual units of system malfunction. Confers with technical personnel in event errors require change of instructions or sequence of operations. Rewinds and removes tape at completion of processing. Maintains operating records, such as machine performance and production reports.

Prerequisites

For Occupation

Work activities require an adjustment to situations that are scientific and technical in nature, as well as to situations that are related to machines, processes, and techniques, and involve business contact with others. Work is routine, concrete, and organized when following program instructions.

The console operator is required to make proper decisions under emergency conditions resulting from error situations. In such instances the worker is faced with alternatives of repeating runs or salvaging all or part of faulty runs. The worker's actions affect decisions as to costly down-time for maintenance. The console operator also makes decisions in terms of factual data contained in program instructions and on a judgmental basis when altering program instructions in emergency situations. Dealing with people in conference situations is sometimes involved in the work of the console operator.

Clerical perception is needed to recognize pertinent details in program instructions, and to maintain accurate records of machine performance and production.

Motor coordination, finger dexterity, and manual dexterity are needed to learn to mount reels of tape on spindles of magnetic tape units and manipulate switches controlling auxiliary equipment.

Reaching and handling are involved in positioning reels. The work requires unrestricted use of hands and fingers to set any of 100 or more 2- to 5-position switches on the control panel or to manipulate appropriate output selector buttons and switches.

Talking and hearing are involved in exchanging information continuously concerning equipment characteristics and requirements.

Color vision is involved in monitoring as many as 200 indicator lights which show normal machine functioning or error situations.

The work is considered light, requiring frequent lifting of reels of instruction or data tape (maximum reel of 20 pounds lifted occasionally) onto appropriate magnetic tape units.

For Occupational Course of Study

Certain aptitudes are required for successful training. Verbal ability is needed to comprehend the meaning of programming instructions and machine logic as applied to a specific technical or business problem, and to learn to present clearly suggestions and ideas to programmers and other technical personnel which may affect their decisions concerning techniques for solving a problem.

As a prerequisite for entering the occupational course the trainee should have skills and knowledge equivalent to that gained from the General Office Education Units suggested as pertinent to this occupation.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Language Skills	30
Business Communications	30
Personal Development	30
Business Principles and Organization I	30
Business Principles and Organization II	30
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Introduction to Computers	30
Specialized Occupation Unit which follows:	
Control Console Operation	60

CONTROL CONSOLE OPERATION

Hours Required

Class: 3 hours daily, Laboratory: 3 hours daily Total: 60 hours

Description

The purpose of this unit is to train the individual in the fundamentals of console operation. Lecture on the basic aspects of operation will be supplemented by laboratory sessions familiarizing the individual with specific equipment. Machine practice will provide actual experience in set-up procedures, manipulation and use of console control, control of peripheral devices, and use of operating aids.

Topic Outline

I. The Control Console in the System
II. Description and Use of the Control Console Features
III. Program Initiation and Operation
IV. Programming and Coding
V. Operating Aids and Procedures
VI. Control Console Practice

TOPIC I. THE CONTROL CONSOLE IN THE SYSTEM

TOPIC II. DESCRIPTION AND USE OF THE CONTROL CONSOLE FEATURES

Since equipment and training will vary at each training location, the description of the specific console is left to the discretion of the teacher. He should cover the location and function of:

A. Lights, switches, and keys
    1. Power source
    2. Power control lights and switches
    3. Emergency lights and switches
    4. Start keys
    5. Alarm control lights and keys
    6. Peripheral equipment control lights and keys
    7. Logic display

B. Register control lights and keys
    1. Register, select, and reset control
    2. Register display lights
    3. Register entry keys
    4. Instruction set-up and execution procedures

C. Memory accessing lights and keys
    1. Memory display lights
    2. Memory entry keys
    3. Procedures for writing to and reading from memory

D. Console typewriter operation

E: Special features

TOPIC III. PROGRAM INITIATION AND OPERATION

A. Program library organization

B. Loading programs from magnetic tape, punch cards, paper tape, or random access devices

C. Automatic program loading routines

D. Error stop procedures

E. Restart procedures

TOPIC IV. PROGRAMMING AND CODING

A. Steps in program preparation

B. Programming fundamentals
  1. Number systems
  2. Word format
  3. Computer address systems
  4. Instruction formats
  5. Flow charting

C. Coding fundamentals
  1. Classification codes
  2. Machine language and communication codes
  3. Coding sheet forms

TOPIC V. OPERATING AIDS AND PROCEDURES

A. Program testing
  1. Error stop information
  2. Debugging aids

B. Operation run books
  1. Organization
  2. Contents
  3. Operating procedures

C. Other operation records
  1. Machine logs
  2. External reel labels
  3. Schedules

D. Utility and assembly programs

E. Executive routing concept

F. Data library organization

G. Housekeeping procedures
  1. Documentation
  2. Tape handling and tape library procedures
  3. Storage of card decks, tapes, and other materials
  4. Neatness and organization

H. Procedures for reporting machine malfunctioning

TOPIC VI. CONTROL CONSOLE PRACTICE

Console practice, or laboratory sessions, which account for 50 percent of the course hours should be closely integrated with the lecture material. When local conditions permit, the first 3 hours of each day should be devoted to lecture and the last 3 hours to console practice. Console exercise should be designed to provide practice related to the preceding lecture material. Console practice should include the following areas:

A. Manipulation of all keys, switches, and lights

B. Data entry to memory

C. Data retrieval from memory

D. Register setting

E. Register display

F. Program loading

G. Running of assembly and utility routines

H. Program running

I. Error correction

J. Use of run books, operating procedures and data library facilities

K. Operation of related peripheral equipment (Magnetic tapes, card and paper-tape printer, console typewriter, on-line printer)

Later practice sessions should build on the knowledge of basic procedures to develop sound judgment in new situations, ability to distinguish machine malfunction from data or program errors, knowledge of restart procedures, and practice in interpreting operating manuals independently to obtain information on procedures.

Texts and Other Teaching Materials

A variety of useful reference manuals and teaching materials can be obtained from local representatives of data processing equipment manufacturers.

RCA 301 Console Operator's Manual and RCA 501 Console Operator's Manual are available at all RCA EDP Branch Sales Offices.

A catalog on console operation texts is available for consultation at any IBM office, although they cannot be distributed generally.

SUPERVISOR, CLERICAL

Job Description D. O. T. No.*

Supervises a group of workers engaged chiefly in one general type of clerical function, as bookkeeping, typing, and filing: Determines procedures of work. Issues written and verbal orders or instructions. Assigns duties to workers and checks their work for exactness and neatness. Makes up composite reports based on individual reports of subordinates. Maintains harmony among workers. Adjusts errors and complaints. May perform essentially the same duties as the other workers, as a regularly assigned duty, or assist subordinates in performing only the more difficult and complicated duties. May keep time reports and other personnel records of quantity and quality of work performed, and may employ, train, and discharge workers. Must be proficient in the particular type of clerical work in which he functions. Designated according to the group of workers he supervises, as chief cashier; filing supervisor; head bookkeeper.

Prerequisites

For Occupation

The work of the clerical supervisor involves an ability to reason and make judgments. The work situation involves directing, controlling, and planning an entire activity, and directing the activities of others.

Verbal ability is needed to understand and present information or ideas clearly.

Clerical perception is required to perceive pertinent detail in verbal or tabular material—to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

For Occupational Course of Study

The occupational units for this trainee are included under the General Office Education Units. Appropriate units for this trainee are listed below.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Payroll Records	30
Personal Development	30
Business Communications	30
Business Principles and Organization I	30
Business Principles and Organization II	30

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*Classifications are made and code numbers are assigned according to the type of work supervised.

Appropriate General Office Education Units (cont'd)	Hours
Fundamentals of Typing	60
Production Typing	60
Office Calculators	10
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Elementary Descriptive Statistics	30
Principles of Supervision	30
Psychology for Supervisors	30
Classification and Coding	20
Introduction to Computers	30

SUPERVISOR, MACHINE-RECORDS UNIT

Job Description **D. O. T. No. 1-25.67**

Supervises workers engaged in keeping records and tabulating reports, using punch cards and special office machines: Sets up machines for new operations. Directs care and cleaning of machines, sometimes making mechanical adjustments and minor repairs in an emergency. Performs other duties as described under Supervisor. May assist administrative officials in planning new accounting methods and designing cards and forms for new clerical processes. May be designated according to trade name of machines used in office, as IBM supervisor.

Prerequisites

For Occupation

The work of the machine-records unit supervisor involves an ability to reason and make judgments. The work situation involves directing, controlling, and planning an entire activity, and directing the activities of others. Ability to deal with people is important.

Verbal ability is required to understand instructions and to present information clearly. Numerical aptitude is required to perform arithmetic operations quickly and accurately. Good visual acuity is required for working with numbers and written material.

Clerical perception is required to perceive pertinent detail in verbal or tabular material—to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

Mechanical aptitude is advantageous. Comprehension of data processing systems in detail is a vital need in making procedural explanations to subordinates on the job.

For Occupational Course of Study

As a prerequisite for entering the occupational course the trainee should have skills and knowledge equivalent to that gained from the General Office Education Units suggested as pertinent for this occupation.

The local instructor may check the trainee's previously acquired abilities against the Standards of Achievement for the General Office Education Units in order to plan the curriculum for the trainee.

Appropriate General Office Education Units	Hours
Business Mathematics I	30
Business Mathematics II	30
Elements of Fiscal Recordkeeping	60
Business Communications	30
Personal Development	30
Business Principles and Organization I	30
Business Principles and Organization II	30
Office Calculators	10
Introduction to Business Data Processing	60
Electro-Mechanical Accounting Machines	30
Elementary Descriptive Statistics	30

Appropriate General Office Education Units (cont'd)	Hours
Principles of Supervision	30
Psychology for Supervisors	30
Classification and Coding	20
Introduction to Computers	30

Specialized Occupation Units which follow:	
Data Processing Mathematics	30
Introduction to Programming	30
Data Processing Systems	90

DATA PROCESSING MATHEMATICS

Hours Required

Class: 1 hour, 3 days/week, Laboratory: 1 hour, 2 days/week Total: 30 hours

Description

This unit provides trainees with a practical foundation in numerical concepts needed for understanding accounting and machine processes as related supervision of machine-records units. Desk calculators may be used. A background in basic mathematics is necessary for starting this course.

Topic Outline

I. Notation
II. Number Systems
III. Number Systems with an Arbitrary Base
IV. Basic Algebra
V. Linear Equations
VI. Fixed and Floating Point Numbers
VII. Elements of Boolean Algebra
VIII. Methods of Numerical Computation
IX. Use of the Computer for Numerical Computation

TOPIC I. NOTATION

A. Concepts of notation
B. Arithmetic progression and series
C. Subscripts
D. Functional notations
E. Exponents
F. Infinite sum
G. Factorials

TOPIC II. NUMBER SYSTEMS

A. Concepts of number systems
B. Base 10 number systems
C. Rational numbers
D. Irrational numbers
E. Powers and roots
F. Logarithms
G. Properties of fractions

TOPIC III. NUMBER SYSTEMS WITH AN ARBITRARY BASE

A. Binary
B. Octal
C. Conversion

TOPIC IV. BASIC ALGEBRA

A. Algebraic expressions
B. Algebraic fractions
C. Factoring
D. Polynomials

TOPIC V. LINEAR EQUATIONS

A. Equations with one unknown
B. Equations with more than one unknown
C. Determinants

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TOPIC VI. FIXED AND FLOATING POINT NUMBERS

A. Fixed point
  1. Scaling
  2. Advantages

B. Floating point
  1. Mantissa
  2. Exponent
  3. Advantages

TOPIC VII. ELEMENTS OF BOOLEAN ALGEBRA (Briefly, as needed)

A. Connectives

B. Truth tables

C. Machine implementation of arithmetic operations

D. Simplification of Boolean algebraic expressions

TOPIC VIII. METHODS OF NUMERICAL COMPUTATION

A. Computation with powers of 10

B. Computation with logarithms

C. Number systems with bases other than 10

TOPIC IX. USE OF THE COMPUTER FOR NUMERICAL COMPUTATION

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Adler, Irving. Thinking Machines: A Layman's Introduction to Logic, Boolean Algebra, and Computers. New York: John Day Co., 1961.

Apostle, H. G. A Survey of Basic Mathematics. Boston: Little, Brown, and Co., 1960.

Ayres, W. L.; Fry, Cleota G.; and Jonah, H. F. S. General College Mathematics. 2d ed. New York: McGraw-Hill Book Co., Inc., 1960.

Crowder, Norman A. The Arithmetic of Computers. Garden City, N. Y.: Doubleday and Co., 1960.

Helton, Floyd F. Introducing Mathematics. 2d ed. New York: John Wiley and Sons, Inc., 1958.

Hohn, Franz E. Applied Boolean Algebra, An Elementary Introduction. New York: The Macmillan Co., 1960.

Moore, J. T. Fundamental Principles of Mathematics. New York: Holt, Rinehart, and Winston, Inc., 1960.

Oakford, Robert V. Introduction to Electronic Data Processing Equipment. New York: McGraw-Hill Book Co., Inc., 1962.

Richards, R. K. Arithmetic Operations in Digital Computers. New York: D. Van Nostrand Co., Inc., 1955.

Richardson, M. Fundamentals of Mathematics. New York: The Macmillan Co., 1958.

Siegel, Paul. Understanding Digital Computers. New York: John Wiley and Sons, Inc., 1961.

Stibitz, George R. and Larrivee, Jules A. Mathematics and Computers. New York: McGraw-Hill Book Co., 1957.

Titchmarsh, E. C. Mathematics for the General Reader. Garden City, N. Y.: Doubleday Publishing Co., 1959.

Wade, Thomas L. and Taylor, Howard E. Fundamental Mathematics. 2d ed. New York: McGraw-Hill Book Co., Inc., 1961.

Young, Frederick H. Digital Computers and Related Mathematics. Boston: Ginn and Co., 1961.

INTRODUCTION TO PROGRAMMING

Hours Required

Class: 1 hour daily, Laboratory: 1 hour daily Total: 30 hours

Description

This unit is designed to provide help in understanding the fundamentals of programming for the person who is involved in supervising the day-to-day application of business data processing problems using computers. While stressing fundamentals, the unit also introduces some higher level concepts with which trainees should be acquainted.

Topic Outline

I. Review of Computer Fundamentals
II. Programming Fundamentals
III. Coding Fundamentals
IV. Steps in Program Preparation
V. Instructions to the Machine
VI. Introduction to Symbolic Programming
VII. Subroutines
VIII. Some Programming Systems
IX. Program Testing and Modification
X. Integrating Programming Fundamentals with Accounting Methods

TOPIC I. REVIEW OF COMPUTER FUNDAMENTALS

A. Computer characteristics

B. Components and functions

C. Applications

TOPIC II. PROGRAMMING FUNDAMENTALS

A. Number systems
   1. Decimal, binary, octal
   2. Arithmetic
   3. Conversion

B. Word format
   1. Data words
   2. Instruction words
   3. Fixed and variable word lengths

C. Computer address systems

D. Flow charting

E. Looping and address modification

TOPIC III. CODING FUNDAMENTALS

A. Classification codes
   1. Alphabetic
   2. Numeric
   3. Alpha-numeric
   4. Mnemonic

B. Machine Language and communication codes
   1. Punched tape (5, 6, 7, 8 channel codes)
   2. Punched card (80 col, 90 col.)
   3. Magnetic tape (5, 6, 7, 8 channel codes)
   4. Character recognition

C. Coding sheet forms

TOPIC IV. STEPS IN PROGRAM PREPARATION

A. Definition and analysis

B. Elements of program design

- C. Coding
- D. Running
- E. Error correction

TOPIC V. INSTRUCTIONS TO THE MACHINE

- A. Instruction formats
- B. Input-output
- C. Arithmetic
- D. Logic control
- E. Error indicators
- F. Rearrangement of data

TOPIC VI. INTRODUCTION TO SYMBOLIC PROGRAMMING

- A. Use of symbolic labels
- B. Operation statements
- C. Address arithmetic
- D. Assembly operation

TOPIC VII. SUBROUTINES

- A. The use of subroutines
- B. Library concept
- C. Open subroutine
- D. Closed subroutine

TOPIC VIII. SOME PROGRAMMING SYSTEMS

- A. Macro-instructional
- B. Assembling and compiling systems
- C. Utility
- D. High-level language

TOPIC IX. PROGRAM TESTING AND MODIFICATION

- A. The test deck
- B. Test results and duplication of errors
- C. Kinds of errors
- D. Error correction

TOPIC X. INTEGRATING PROGRAMMING FUNDAMENTALS WITH ACCOUNTING METHODS

Practice case studies

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Chapin, Ned. Programming Computers for Business Applications. New York: McGraw-Hill Book Co., Inc., 1961.

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Nathan, Robert and Hanes, Elizabeth. Computer Programming Handbook. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962.

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________, Digital Computer Components and Circuits. Princeton, N. J.: D. Van Nostrand Co., 1957.

Sherman, Philip M. Programming and Coding Digital Computers. New York: John Wiley and Sons, Inc., 1963.

Siegel, Paul. Understanding Digital Computers. New York: John Wiley and Sons, Inc., 1961.

Stibitz, George R. and Larrivee, Jules A. Mathematics and Computers. New York: McGraw-Hill Book Co., 1956.

Williams, Samuel B. Digital Computing Systems. New York: McGraw-Hill Book Co., Inc., 1959.

DATA PROCESSING SYSTEMS

Hours Required

Class: 1 hour daily, Laboratory: 2 hours daily — Total: 90 hours

Description

This unit is designed to provide the supervisory trainee with an understanding of concepts and procedures in business data processing systems. Applications for basic business accounting operations should be given in detail, and case studies used to illustrate the different applications.

Topic Outline

I. Brief Review of Data Processing
II. Systems Concepts in Business
III. Charts, Forms, and Records
IV. Accounts Receivable Applications
V. Accounts Payable Applications
VI. Payroll Applications
VII. Inventory Control Applications

TOPIC I. BRIEF REVIEW OF DATA PROCESSING

A. Importance and use of data

B. Evolution and growth of data processing

C. Specific applications of business data processing

D. Basic data processing cycle

TOPIC II. SYSTEMS CONCEPTS IN BUSINESS

A. The systems approach

B. Types of systems

C. Parts of a system

D. The business as a system

E. Systems survey, design, and implementation

TOPIC III. CHARTS, FORMS, AND RECORDS

A. Types of systems charts
   1. Organization charts
   2. Work and schedule charts
   3. Statistical tables and graphical charts

B. Flow charts
   1. Types
   2. Applications

C. Record and report layouts

D. Specifications for magnetic encoded checks

E. Forms design requirements
   1. Elements of a form
   2. Forms numbering and classification systems
   3. Steps in forms design
   4. Specification writing

TOPIC IV. ACCOUNTS RECEIVABLE APPLICATIONS

A. Objectives and importance of accounts receivable

B. Making entries—effects on general ledger, journal, and sales records

C. Controls

D. Handling methods
    1. Open item
    2. Balance forward

E. Applications for electromechanical data processing machines
    1. Open item
    2. Balance forward

F. Applications for computing machines
    1. Open item
    2. Balance forward

G. Case studies

TOPIC V. ACCOUNTS PAYABLE APPLICATIONS

A. Objectives and importance of accounts payable

B. Functions of accounts payable department

C. Effect on general ledger and journal

D. Establishing liability accounts
    1. Purchases requisition
    2. Purchasing department functions
    3. Purchase order preparation

E. Validating liability accounts
    1. Internal expenses
    2. Outside charges
    3. Receiving reports
    4. Debit memos

F. Posting liabilities
    1. Ledgers and journals
    2. Discounts

G. Writing checks

H. Applying distributions
    1. Allocating expenses
    2. Analyzing records

I. Accounting controls

J. Applications for electromechanical data processing machines

K. Applications for computing machines

L. Case studies

TOPIC VI. PAYROLL APPLICATIONS

A. Objectives and importance of payroll applications

B. Organization for payroll control

C. Effects on balance sheets and income statements

D. Payroll source data
    1. Attendance documents
    2. Production documents
    3. Deduction documents
    4. Computative data
    5. Classification data
    6. Identification data

E. Controls

F. Types of payroll
    1. Hourly
    2. Salary
    3. Incentive

G. Payroll calculation (practice exercises)

H. Overtime

I. Tax and deduction computation

J. Payroll register

K. Checks and earnings statements

L. Tax reports

M. Payroll cost analysis and distribution

N. Procedure study requirements

O. Applications for electromechanical data processing machines

P. Applications for computing machines

Q. Case studies

TOPIC VII. INVENTORY CONTROL APPLICATIONS

A. Objectives and importance of inventory control

B. Organization for inventory control
    1. Establishing controls
    2. Procedural approaches

C. Applications for electromechanical data processing machines

D. Applications for computing machines

E. Case Studies

Texts and Other Teaching Materials

From the following suggested texts and materials (or other equivalent commercially available material), select trainee and teacher materials for use in this unit. Additional references are listed in Appendix B.

Bell, W. D. A Management Guide to Electronic Computers. New York: McGraw-Hill Book Co., Inc., 1957.

Canning, Richard G. Electronic Data Processing for Business and Industry. New York: John Wiley and Sons, Inc., 1956.

________, Installing Electronic Data Processing Systems. New York: John Wiley and Sons, Inc., 1956.

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________, Programming Computers for Business Applications. New York: McGraw-Hill Book Co., Inc., 1961.

Churchman, C. W.; Ackoff, R. L.; and Arnoff, E. L. Introduction to Operations Research. New York: John Wiley and Sons, Inc., 1957.

Gregory, Robert H. and Van Horn, Richard L. Automatic Data-Processing Systems. Belmont, Calif.: Wadsworth Publishing Co., 1960.

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Irwin, Wayne C. Digital Computer Principles. Princeton, N. J.: D. Van Nostrand Co., 1961.

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Kometsky, G. and Kirchner, P. Electronic Computers and Management Control. New York: McGraw-Hill Book Co., Inc., 1956.

Laden, H. N. and Gildersleeve, J. R. System Design for Computer Applications. New York: John Wiley and Sons, Inc., 1963.

Laurie, Edward J. Computers and How They Work. Cincinnati, Ohio: South-Western Publishing Co., 1963.

Levin, Howard S. Office Work and Automation. New York: John Wiley and Sons, Inc., 1956.

Martin, E. Wainright. Electronic Data Processing. Homewood, Ill. Richard D. Irwin, Inc., 1961.

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McGill, Donald A. C. Punched Cards Data Processing for Profit Improvement. New York: McGraw-Hill Book Co., Inc., 1962.

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Neuschel, Richard F. Management by System. 2d ed. New York: McGraw-Hill Book Co., Inc., 1960.

Optner, Stanford L. Systems Analysis for Business Management. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1960.

Randall, C. B.; Weimer, S. W.; and Greenfield, M. S. Systems and Procedures for Automated Accounting. Cincinnati, Ohio: South-Western Publishing Co., 1962.
Laboratory Problems, Cards and Forms Design Kit, Teachers' Manual.

Wanous, S. J. and Wanous, E. W. Automation Office Practice. Cincinnati, Ohio: South-Western Publishing Co., 1964.
Teachers' Manual. Office Practice Set.

APPENDIX A—SUGGESTED STANDARDS OF ACHIEVEMENT

Acceptable vocational competencies in a job classification will vary according to local labor and employer standards. The following suggested standards reflect professional opinion concerning generally accepted achievement levels in the subject areas.

Standards of performance are divided into two areas: those subjects in which objective skill measurement is fairly well standardized, and those subjects in which reliance must be placed on the teacher's business knowledge and previous teaching experience. These latter subjects are primarily concerned with acquisition of knowledge, development of attitudes, and demonstration of acceptable behavior.

The suggested standards should not be considered rigidly minimal. Rather, they should be looked upon as guides in evaluating trainee achievements and class goals.

Evaluation of each trainee by the teacher should include the use of selected class tests, workbook grading, and final tests. In addition, the teacher should note trainee interest, contributions, and motivation.

GENERAL OFFICE EDUCATION UNITS

BUSINESS MATHEMATICS I

Accurately (95% or better) perform calculations of percentages, averages, measurements, and simple money statements involving proficiency in conversion and use of fractions and decimals

BUSINESS MATHEMATICS II

a. Accurate (95% or better) calculation of simple payrolls, discounts and prices, interest rates, and interest yields
b. Accurate (95% or better) calculation of deferred payments and charges, discount and discount rates on notes and drafts
c. Knowledge of the simpler types of insurance and tax computations

ELEMENTS OF FISCAL RECORDKEEPING

a. Knowledge of basic bookkeeping, including simple entries in double entry system
b. Knowledge of the nature and application of common business records
c. Average degree of proficiency in completion of common and simple records
d. Demonstrated ability to handle cash transactions accurately (no errors)
e. Knowledge of double-entry bookkeeping. Simple journal and ledger entries
f. Knowledge of source records required for posting

PAYROLL RECORDS

a. Understand payroll accounting procedures
b. Compute payroll deductions and make required reports
c. Make accurate payroll calculation from source data (100% accuracy)

LANGUAGE SKILLS

a. Correct spelling of the more commonly used business English words
b. Know meaning, use, and spelling of general business terms and most frequently used data processing terms
c. Knowledge of rules of punctuation, capitalization, and abbreviations
d. Ability to construct sentences and use phrases and clauses correctly
e. Test level of achievement. Course unit content knowledge (approximately 90%)

BUSINESS COMMUNICATIONS

a. Knowledge and understanding of the fundamental principles of effective communication
b. Adequate mastery of the mechanics of English
c. Preparation of simple letters from rough notes
d. Handling of appointments, schedules, and acknowledgments
e. Use of source material for information
f. Ability to compose letters and reports

PERSONAL DEVELOPMENT

a. Knowledge of basic office customs
b. Acceptable appearance and clear, distinct speech
c. Demonstration of good personal habits and application of common sense to routine office work
d. Understanding of self—personality, motives, emotions—and demonstrated willingness to strive for self-improvement
e. Ability to adjust to group work situations: human relations, teamwork
f. Ability to work independently, organize work, and recognize superior-subordinate relationships

BUSINESS PRINCIPLES AND ORGANIZATION I

Knowledge of fundamentals of course unit in regard to types of business organizations and managerial structure and functions (85 to 90% grades on tests of factual material in course content)

BUSINESS PRINCIPLES AND ORGANIZATION II

a. Knowledge of basic techniques and importance of management of finance, personnel, and production
b. Basic understanding of simpler business and government relationships
c. Appreciation of personal relationships in office of superiors, subordinates, and co-workers

FUNDAMENTALS OF TYPING

a. Keyboard mastery; understanding of principles and techniques of touch typing
b. Concept of neatness and attractiveness of typwritten product; knowledge of how to proofread copy and correct errors
c. Ability to make applications of typing skill to basic letter forms, simple tabulations, simple manuscript typing, simple office forms
d. Clean typewriters; change ribbons
e. Type straight copy, average difficulty, 3 minutes—approximately 35 to 50 wpm (gross)—3 errors or fewer

PRODUCTION TYPING

a. Keyboard mastery, including number and symbol keys, and correct operation of service parts
b. Knowledge, skill, and judgment to produce neat, attractive typewritten "jobs" of some complexity with a minimum of direction and with a sense of responsibility for the correctness of the items from all standpoints
c. Ability to produce mailable business letters of approximately 120 words in 5 minutes; manuscript copy, double-spaced, with headings, from plain copy, 200 words in 10 minutes; tabulated material, 4 columns, with headings, from plain copy (10 items per column) in 5 minutes
d. Knowledge of typing common business documents, including fill-in typing on printed forms
e. Ability to type "masters" for reproduction
f. Appropriate care of the machine: cleaning, changing ribbon, etc.
g. Type straight copy, average difficulty, 5 minutes—approximately 45 wpm or more (gross)—3 errors or fewer

OFFICE CALCULATORS

a. Tabulation of 50 handwritten checks in 1 minute or less; No errors
b. Listing from columnar figures 80-to 100-keys-per-minute rate
c. Knowledge and use of reciprocal tables with full-key adding machine
d. Identify basic calculators and know uses in clerical activities
e. Proficiency in touch system with 10-key and full-key adding machines as per (a) and (b)
f. Ability to add, multiply, subtract, and divide on adding machines and calculators

INTRODUCTION TO BUSINESS DATA PROCESSING

a. Knowledge of special vocabulary of data processing
b. Understanding of what data processing is and of its importance to business
c. Understanding of the steps in a data processing cycle
d. Basic knowledge of functions of data processing equipment
e. Knowledge of the functions of a data processing department and of peripheral data processing occupations

ELECTRO-MECHANICAL ACCOUNTING MACHINES

a. Knowledge of basic functions, features, and operating procedures of each piece of equipment
b. Knowledge of basic housekeeping procedures for each piece of equipment
c. Theoretical understanding of the accounting applications of electro-mechanical accounting machines

ELEMENTARY DESCRIPTIVE STATISTICS

a. Understanding of elementary statistics and its uses
b. Knowledge of statistical measurement
c. Knowledge of graphical presentation
d. Understanding of basic sampling concepts
e. Ability to organize and interpret statistical data
f. Knowledge of the use of statistics as a means of communicating business information

PRINCIPLES OF SUPERVISION

a. Understanding of management functions
b. Understanding of the nature of supervisory responsibilities
c. Knowledge of effective use of authority
d. Knowledge of performance evaluation techniques

PSYCHOLOGY FOR SUPERVISORS

Basic understanding of human relations, morale and productivity as affected by work climate

CLASSIFICATION AND CODING

a. Knowledge of various coding systems
b. Ability to read flow charts
c. High degree of skill in coding
d. Knowledge of various machines and systems which can be used in handling data processing problems, and of how to communicate with these machines through various coding systems

INTRODUCTION TO COMPUTERS

a. Knowledge of electronic data processing vocabulary
b. Understanding of the general principles of a computer system
c. Knowledge of computer elements and their purposes
d. Basic knowledge of programming fundamentals

SPECIALIZED OCCUPATION UNITS

ELEMENTARY LIBRARY SYSTEMS

a. Understanding of the organization and function of a data processing library
b. Knowledge of basic recordkeeping systems
c. Knowledge of the classification of data processing materials
d. Knowledge of handling and preservation of data processing materials
e. Knowledge of receipt, storage, and issue procedures

KEY-PUNCH EQUIPMENT OPERATION

a. Knowledge of all operative parts of the key-punch machine
b. Ability to prepare program cards
c. Ability to produce a minimum of 5000 correct key strokes per hour

TABULATING MACHINE OPERATION

a. Mastery of all operating features of the machine
b. Competency in all machine functions
c. Ability to list all steps in the flow of data from the raw source to report with a complete description of the activity performed at each step

TABULATING MACHINE WIRING

Ability to apply control panel wiring principles and procedures pertaining to all functions of tabulating machines

CONTROL CONSOLE OPERATION

a. Display full knowledge of proper tape and card handling and housekeeping procedures
b. Recognize and use the records of a tape library
c. Understand data flow through machine register operation and basic programming concepts and instructions
d. Display thorough understanding of run manual and operating records maintenance
e. Identify the features of a control console and perform basic practice exercises accurately, displaying knowledge of programming runs and tests and error correction
f. Using a run book, set up and monitor the processing of a programming application without supervision
g. Demonstrate understanding of utility and assembly routines, and be able to use their respective operation manuals correctly and independently
h. Identify any unusual console conditions selected by the instructor and take appropriate actions

DATA PROCESSING MATHEMATICS

a. High degree of understanding of number systems
b. Ability to handle various basic mathematical computations necessary for understanding and using data processing equipment
c. Ability to understand application of these numerical concepts to computer programming problems

INTRODUCTION TO PROGRAMMING

a. Knowledge of computer fundamentals
b. Basic understanding of programming techniques for business applications
c. Knowledge of flow charting

DATA PROCESSING SYSTEMS

a. Understanding of the function of data processing systems in business
b. Basic understanding of data processing equipment
c. Knowledge of charts and forms used in business data processing
d. Knowledge of business systems, procedures, and desired outputs

APPENDIX B—TYPICAL MATERIALS FOR INSTRUCTIONAL PURPOSES

SAMPLE SUGGESTED LESSON PLAN

A good unit of instruction provides various kinds of learning activities that should be coordinated with each other for maximum effect, and an effective teacher's guide can aid in such coordination. Among helpful learning activities are demonstrations, lectures, directed study, supervised practice, and examinations. Many approaches are thus made to the problems in the unit, and the trainee takes a basic step in learning as he solves problems through these approaches. A typical teacher's guide may suggest topics for presentation by using various teaching techniques—lecture, audiovisual presentation, individual or group activities or discussion, formal or informal review, and oral or written examination. Each separate activity should contribute its part to the mastery of the content of the unit.

The sample suggested lesson plan of a teacher's guide presented here is illustrative of suggested methods of unitizing material for class presentation under the appropriate subtopic or topic of a typical course outline. The individual teacher may expand or contract the detail contained in his own personal guide as his particular experience dictates. Rigorous adherence to the format is neither recommended nor intended. It is a helpful instructional aid when new or infrequently occurring subject content is to be presented.

CODING AND CLASSIFICATION

Lesson X—Flow Charts, Part I, "Types of Charts"
Review: 5 minutes
Lecture and demonstration: 35 minutes
Discussion and preview: 10 minutes
Materials: Coding sheets, Example flow charts, flow chart symbol sheets

Topic Outline

- I. Review of preceding lesson
  - A. Codes
  - B. Coding sheet forms
  - C. Cover any material not covered in prior session plan
- II. Flow chart fundamentals
  - A. The flow chart defined
  - B. Uses of flow charts
  - C. Flow charts in manual systems
  - D. Flow charts in automatic data processing systems
  - E. The flow chart as a means of communication
  - F. Elements of a flow chart
  - G. The flow charting process
  - H. How the coder uses flow charts
- III. Types of flow charts
  - A. Process
    - 1. Uses
    - 2. Examples
      - a. Block diagrams: inventory application
      - b. Flow charts using symbols: payroll application
  - B. Detail
    - 1. Uses

B. Detail (cont'd)
  2. Examples
    a. Block diagrams: Social Security computation
    b. Flow charts using symbols: payroll application
C. Relationship of detail charting to process charting

IV. Examples of flow charts and flow chart development

V. Discussion and questions

VI. Preview of next lession: Flow Charts, Part II, "Symbols and Organization"

Reading assignment for Lesson XI: Hein, An Introduction to Electronic Data Processing for Business, pages 110 to 129.

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Hein, Leonard W. An Introduction to Electronic Data Processing for Business, Princeton, N.J.: D. Van Nostrand Co., 1961. p. 90-110.

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McCracken, Daniel D.; Weiss, H.; and Lee, T. Programming Business Computers. New York: John Wiley and Sons, Inc. 1959. p. 26-43.

INSTRUCTIONAL MATERIALS

The following instructional materials have not been previously listed in the course units. They are included here to assist the teacher in finding appropriate and useful supplementary materials. Although this list is by no means exhaustive, it will serve as a convenient initial source of many helpful materials.

For the further convenience of the teacher who may wish to find materials appropriate to a particular subject area quickly, many of the items have been assigned codes which indicate the subject area(s) for which any particular item appears most appropriate. The codes do not specificially refer to titles of units as they appear in the curricula.

Code	Subject Area
A	Accounting and Recordkeeping
BDP	Business Data Processing
BP&O	Business Principles and Organization
C	Computers
CO	Console Operation
C&P	Coding and Programming
CTO	Card-Tape Converter Operation
DPS	Data Processing Systems
E	English

Code	Subject Area
EAM	Electro-Mechanical Accounting Machines
HSP	High-Speed Printer
I	Instructor's reference (advanced texts, additional source lists, and similar materials)
KP	Key Punch Operation
M&S	Mathematics and Statistics
MT	Machine Tabulating
OC	Office Calculators
OS	Principles of Supervision
PD	Personal Development
PS	Psychology for Supervisors
TL	Tape Library
T	Typing
W	Wiring

NOTE: The addresses of publishers, producers, and additional sources of materials may be found in APPENDIX C.

TEXTS AND REFERENCES

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(M&S) Allendoerfer, C.B. and Oakley, C.O. Principles of Mathematics. New York: McGraw-Hill Book Co., Inc., 1955.

(I) Alt, Franz L. and Rulunoff, M., eds. Advances in Computers, 4 vols. New York: Academic Press, 1960-63.

(OS, I) Archer, Fred C.; Brecker, Raymond F.; and Frakes, John C. General Office Practice, 2d ed. New York: McGraw-Hill Book Co., Inc., 1963.

(E) Aurner, Robert R. and Burtness, Paul S. Effective English for Business, 5th ed. Cincinnati, Ohio: South-Western Publishing Co., 1962. Study Projects (Workbook); Tests 1-3 and Final Examination, Teacher's Manual.

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(T) Bendixen, E.T. and Ricksen, H.B. Production Typing, 2d ed. Cincinnati, Ohio: South-Western Publishing Co., 1958. Laboratory Material; Instructor's Manual.

(BDP, BP&O) Bethel, Lawrence L.; Atwater, Franklin S.; Smith, George H.E.; and Stackman, Harvey A., Jr. Industrial Organization and Management. New York: McGraw-Hill Book Co., Inc., 1962.

(OS) Bittel, L.R. What Every Supervisor Should Know. New York: McGraw-Hill Book Co., Inc., 1959.

(I) Bowman, Edward H. and Fetter, Robert B. Analysis for Production Management. Homewood, Ill.: Richard D. Irwin, Inc. 1957.

(A) Boynton, L.D. Methods of Teaching Bookkeeping and Accounting. 2d ed. Cincinnati, Ohio: South-Western Publishing Co. Available summer 1964.

(I) Brown, L. Communicating Facts and Ideas in Business. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961.

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(I, C&P) Colman, Harry L. and Smallwood, Clarence P. Computer Language: An Autoinstructional Introduction to Fortran. New York: McGraw-Hill Book Co., Inc., 1962.

(E) Cox, H.L. Coping with Correspondence. New York: Sterling Publishing Co., Inc., 1962.

(I, W) Data Processing Wiring Guide. Detroit, Mich.: American Data Processing, Inc.

(I) Delta Pi Epsilon, Bibliography of Teaching Materials in Business Education. New York: New York University Press.

(I) Delta Pi Epsilon, The Business Teacher Learns from Cases. Cincinnati, Ohio: South-Western Publishing Co., 1957.

(A) Dictionary of Bookkeeping and Accounting Terminology, rev. ed. Cincinnati, Ohio: South-Western Publishing Co., 1962.

(I) Douglas, L.V.; Blanford, J.T.; and Anderson, R.L. Teaching Business Subjects. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958.

(M&S) Dutton, W.H. and Adams, L.J. Arithmetic for Teachers. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961.

(I) Flores, Ivan. Computer Logic: The Functional Design of Digital Computers. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960.

(I, M&S) Fowler, F.P. and Sandberg, E.W. Basic Mathematics for Administration. New York: John Wiley and Sons, Inc., 1962.

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(E) Gruber, E. Grammar and Spelling Made Simple. New York: Arco Publishing Co., Inc., 1955.

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(I, EAM, BDP) How to Increase the Effective Capacity of IBM Punched Cards. Detroit, Mich.: American Data Processing, Inc.

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(I) Lamb, M.M. Your First Year of Teaching Typewriting. 2d ed. Cincinnati, Ohio: South-Western Publishing Co., 1959.

(E) Larson, G. Business English Essentials. 2d ed. New York: McGraw-Hill Book Co., Inc., 1959. Workbook.

(BP&O) Lawrence, N.R. Secretary's Business Review. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1959.

(A, BDP) Lazzaro, Victor, ed. Systems and Procedures: A Handbook for Business and Industry. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1959.

(C&P, C, I) Leeson, Daniel N. and Dimitry, Donald L. Basic Programming Concepts and the IBM 1620 Computer. New York: Holt, Rinehart and Winston, Inc., 1962.

(PD, PS) MacGibbon, E.G. Fitting Yourself for Business, 4th ed. New York: McGraw-Hill Book Co., Inc., 1961.

(PD) ________. Manners in Business, rev. ed. New York: The Macmillan Co., 1954.

(M&S) McCollough, Celeste and Van Atta, Loche. A Programmed Introduction to Statistical Concepts. New York: McGraw-Hill Book Co., Inc., 1963.

(M&S) McMackin, F.J.; Marsh, J.A.; and Baten, C.E. Arithmetic of Better Business. Boston: Ginn & Co., 1959. Diagnostic Tests.

(BP&O) McNaughton, W.L. Introduction to Business Enterprise. New York: John Wiley & Sons, Inc., 1960.

(PS) Maier, Norman R.F. Principles of Human Relations. New York: John Wiley & Sons, Inc., 1958.

(M&S) Mallory, V.S. and others. Commercial Arithmetic. Syracuse, N.Y.: L.W. Singer Co., Inc., 1956.

(OC, A) Meehan, J.R. and Kahn, G. How to Use Full Keyboard Adding Machines. New York: McGraw-Hill Book Co., Inc., 1955. Workbook.

(OC) ________ How to Use Ten-Key Adding Machines. New York: McGraw-Hill Book Co., Inc., 1955. Workbook.

(E) Modern English Spelling. 2d ed. A Programmed Textbook. New York: TMI Grolier, 1961.

(I) Monroe, Alfred J. Digital Processes for Sampled Data Systems. New York: John Wiley and Sons, Inc., 1962.

(PD) Morgan, Clifford T. and Deese, James. How to Study. New York: McGraw-Hill Book Co., Inc., 1957.

(I) Nanassy, L.C., ed. Business Education Index. Delta Pi Epsilon and Gregg. Annual issues since 1940.

(I) National Office Management Association. Manual of Practical Office Short Cuts, Vol. I. New York: McGraw-Hill Book Co., Inc., 1947.

(I) ________, Practical Office Time Savers, Vol. II. New York: McGraw-Hill Book Co., Inc., 1957.

(OS, PS) Niles, H.E.; Niles, M.C.; and Stephens, J.C. The Office Supervisor: His Relations to Persons and to Work. 3d ed. New York: John Wiley & Sons, Inc., 1959.

(OS, PS) Parker, W.E. and Kleemeier, R.W. Human Relations in Supervision. New York: McGraw-Hill Book Co., Inc., 1951.

(A) Perry, E.C.; Frakes, J.C.; and Zabornik, J. F. Clerical Bookeeping. New York: Pitman Publishing Corp., 1957.

(A, PD) Polishook, W.M.; Beighey, C.; and Wheland, H. E. Elements of General Business. rev. ed. Boston: Ginn & Co., 1955. Workbook; Tests; Manual.

(PD) Post, E. Etiquette, 9th ed. New York: Funk & Wagnalls Co., 1955.

(EAM, BDP, I) Punched Card Applications Handbook. Detroit, Mich.: American Data Processing, Inc.

(E) Punctuation, Modern English Series, 2d ed. A Programmed Textbook. New York: TMI-Grolier, 1961.

(T) Reynolds, H. and Skimin, E. Office Practice Typewriting. New York: McGraw-Hill Book Co., Inc., 1954.

(M&S) Rosenberg, R.R. Business Mathematics. 2d ed. New York: McGraw-Hill Book Co., Inc., 1959. Exercises; Problems; Tests.

(I) Russon, A.R. and Wanous, S.J. Philosophy and Psychology of Teaching Typewriting. Cincinnati, Ohio: South-Western Publishing Co., 1960.

(W, CO, BDP) Salmon, Lawrence. IBM Machine Operation and Wiring, Belmont, Calif.: Wadsworth Publishing Co., 1962.

(E) Schaffer, V. and Shaw, H. McGraw-Hill Handbook of English. 2d ed. New York: McGraw-Hill Book Co., Inc., 1960. Correlated Filmstrip Series.

(BDP, C) Schmidt, R.N. and Meyers, W.E. Electronic Business Data Processing. New York: Holt, Rinehart and Winston, Inc., 1963.

(I) Scott, Norman R. Analog and Digital Computer Technology. New York: McGraw-Hill Book Co., Inc., 1960.

(T) Scott, W.E.; Hamilton W.J.; and Hertzfeld, A. Modern Basic Typewriting. New York: Pitman Publishing Corp., 1954.

(E) Sheppard, M. Plain Letters—The Secret of Successful Business Writing. New York: Simon and Schuster, Inc., 1960.

(I, C) Smith, Charles V.L. Electronic Digital Computers. New York: McGraw-Hill Book Co., Inc., 1959.

(PD) Sparling, A.E. Practice in Office Work. New York: McGraw-Hill Book Co., Inc., 1949. Workbook.

(BP&O, A) Spengler, E.H. and Klein, J. Introduction to Business. 4th ed. New York: McGraw-Hill Book Co., Inc., 1955. Workbook.

(OS) Spriegel, W.R.; Schulz, E.; and Spriegel, W.B. Elements of Supervision. 2d ed. New York: John Wiley & Sons, Inc., 1957.

(PD) Staton, Thomas F. How to Study. Montgomery, Ala.: How to Study.

(M&S, C) Stibitz, George R. and Larrivee, Jules A. Mathematics and Computers. New York: McGraw-Hill Book Co., Inc., 1956.

(T, PD) Strony, M.S. and Greenaway, M.E. The Secretary at Work. 2d ed. New York: McGraw-Hill Book Co., Inc., 1958. Records; Filmstrip Series, Workbook.

(I) Tonne, H.A. Principles of Business Education. 2d ed. New York: McGraw-Hill Book Co., Inc., 1954.

(I) Tonne, H.A.; Popham, E.: and Freeman, M.H. Methods of Teaching Business Subjects. 2d ed. New York: McGraw-Hill Book Co., Inc., 1957.

(I, BDP) Total Systems. Detroit, Mich.: American Data Processing, Inc.,

(T) Typing Homework Series. Self-Study Workbook. 30 assignments. Huntington, N.Y.: Educational Developmental Laboratories.

(C, C&P, BDP) Van Handel, Paul, ed. Electronic Computers: Fundamentals, Systems and Applications. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1961.

(EAM, C&P, TL) Van Ness, Robert J. Principles of Punched Card Data Processing. Elmhurst, Ill.: Business Press, 1962.

(PD) Vanderbilt, A. Complete Book at Etiquette. rev. ed. New York: Doubleday & Co., 1958.

(I) Von Neumann, John. The Computer and The Brain. New Haven, Conn.: Yale University Press, 1958.

(E) Webster's Third New International Dictionary of the English Language. Springfield, Mass.: G. & C. Merriam Co., 1961.

PERIODICALS, GUIDES, AND DIRECTORIES

It is suggested that the teacher become acquainted with some of the following materials. Their contents are both specific and general, and may be applicable to several areas of business education.

Administrative Management. Geyer-McAllister, Inc., 212 5th Avenue, New York, N.Y. 10010

American Business. 4660 Ravenswood Ave., Chicago, Ill. 60640

American Business Education. University of Connecticut, Storrs, Conn. 06268

Audio-Visual Aids for Data Processing Systems and Automation. 1963, Data Processing Management Association. Park Ridge, Ill. 60068

Automation. A Penton Publication, Penton Building, Cleveland, Ohio. 44013

Balance Sheet. South-Western Publishing Co., 5101 Madison Rd., Cincinnati, Ohio. 45227

Business Automation. OA Business Publications, Inc., 288 Park Avenue West, Elmhurst, Ill. 60126

Business Education World. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N.Y. 10036

Business Management. Management Magazines, Inc., 22 West Putnam Ave., Greenwich, Conn. 06830

Business Newsmagazine. The Alsen Publishing Co., 1445 N. Fifth St., Milwaukee, Wis. 53212

Business Screen. Business Screen Magazine, Inc., 7064 Sheridan Rd., Chicago, Ill. 60626

Business Week. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York, N.Y. 10036

Canadian Controls and Instrumentation. A Maclean-Hunter Publication, 481 University Ave., Toronto 2, Ontario, Canada.

Check List of All Available Teaching Aids. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632

Communications of the A.C.M. Association for Computing Machinery, 211 E. 43rd St., New York, N.Y. 10017

Computer Applications Services. American Data Processing, Inc., 2200 Book Tower, Detroit, Mich. 48226

Computers and Automation. Berkeley Enterprises, Inc., 815 Washington St., New Somerville, Mass. 02143

Computers & Data Processing. 217 Broadway, New York, N.Y. 10007

Control Engineering. McGraw-Hill Publishing Co., 330 W. 42nd St., New York, N.Y. 10036

Data Processing for Education. American Data Processing, Inc., 2200 Book Tower, Detroit, Mich. 48226

Data Processing for Management. American Data Processing, Inc., 2200 Book Tower, Detroit, Mich. 48226

Data Processing Yearbook. American Data Processing, Inc., 2200 Book Tower, Detroit, Mich. 48226

Data Systems Engineering. E.H. Nelson Publishing Co., Inc., 510 Madison Ave., New York, N.Y. 10022

Datamation. F.D. Thompson Publications, Inc., 141 E. 44th St., New York, N.Y. 10017

Directory of Films about Property, Casualty and Surety Insurance. Insurance Information Institute, 110 William St., New York, N.Y. 10038.

Directory of 2660 16mm Film Libraries. Department of Health, Education and Welfare, Washington, D.C. 20202

Educators Guide to Free Films. Educators Progress Service, Dept. AVG. Randolph, Wis. 53956

Educators Guide to Free Slidefilms. Educators Progress Service, Dept. AVG, Randolph, Wis. 53956

Employment Outlook of Electronic Computer Operating Personnel and for Programmers. (BLS Bulletin 1300-34) U.S. Government Printing Office, Washington, D.C. 20402

Financial Executive. Financial Executives Institute, 50 W. 44th St., New York, N.Y. 10036

Instrument and Apparatus News. Instruments Publishing Co., 845 Ridge Ave., Pittsburgh, Pa. 15212

Instruments and Control Systems. Instruments Publishing Co., 845 Ridge Ave., Pittsburgh, Pa. 15212

Instruments and Control Systems Buyers' Guide. Instruments Publishing Co., 845 Ridge Ave., Pittsburgh, Pa. 15212

International Business Automation. OA Business Publications, Inc., 288 Park Avenue West, Elmhurst, Ill. 60126

ISA Journal. Instrument Society of America, Penn-Sheraton Hotel, 530 William Penn Place, Pittsburgh, Pa. 15219

Journal of Accountancy. American Institute of Certified Public Accountants, 666 Fifth Ave., New York, N.Y. 10019

Journal of College Placement. College Placement Council, Inc., 35 E. Elizabeth Ave., Bethlehem, Pa. 18018

Jounral of Data Management. Data Management Association, 524 Busse Highway, Park Ridge, Ill. 60068

Journal of the American Society of Training Directors. American Society of Training Directors, 2020 University Ave., Madison, Wis. 53705

Modern Office Procedures. Industrial Publishing Corp., 812 Huron Road, Cleveland, Ohio. 44115

Nations Business. U.S. Chamber of Commerce, 1615 H St., NW., Washington, D.C. 20006

The New UNIVAC Educational Package. The Educational Marketing Department, UNIVAC Division, Sperry Rand Corp., 2121 Wisconsin Ave., NW., Washington, D.C. 20007

Occupations in Electronic Data-Processing Systems. U.S. Department of Labor, 1959. U.S. Government Printing Office, Washington, D.C. 20402

Office. Office Publications, 60 E. 42nd St., New York, N.Y. 10017

Personal Market Place. Merchandiser Publishing Co., Inc., 419 Park Ave. S., New York, N.Y. 10016

Pitmanite. Pitman Publishing Corp., 2 W. 45th St., New York, N.Y. 10036

Reproduction Methods for Business and Industry - RM. Gellert-Wolfman Publishing Co., 33 W. 60th St., New York, N.Y. 10023

Scientific American. Scientific American Inc., 415 Madison Ave., New York, N.Y. 10017

Systems. United Business Publications, Inc., 200 Madison Ave., New York, N.Y. 10016

The National Public Accountant. National Society of Public Accountants, 919 18th St., NW., Washington, D.C. 20006

Today's Secretary. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N.Y. 10036

Typewriting News. South-Western Publishing Co., 5101 Madison Rd., Cincinnati, Ohio. 45227

The Typing Teacher. 4006 Carlisle Ave., Baltimore, Md. 21216

Visual Aids for Business and Economic Education, rev. 1961. (Monograph 92). South-Western Publishing Co., 5101 Madison Rd., Cincinnati, Ohio. 45227

FILMS AND FILMSTRIPS

Abbreviations Used in Descriptions

BW - Black & White
Col - Color
FS - Filmstrip
Min. - running time in minutes
MP - Motion Picture
Si - Silent
So - Sound

(OC, A) Accounting and Calculating Machines. MP-So-BW-12 min. Teaching Aids Exchange.

(A) Accounting Cycle Direct Ledger Entry, The. FS-Si. Business Education Films.

(A) Accounting Series. 11 FS-Si-BW. McGraw-Hill Book Co., Inc.

(PD, PS)	As Others See Us. MP-So-BW-10 min. British Information Service.
(C, BDP)	Automatic Computers. MP-So-Col-16 min. International Business Machines.
(BDP, C)	Automation. A CBS NEWS "See It Now" Production. MP-So-BW-84 min. McGraw-Hill Book Co., Inc.
(BDP)	Automation of B.J. Blurch, Inc., The. MP-So-Col-16 min. DPMA International Headquarters.
(A)	Banks and Credit. MP-So-BW-10 min. Coronet Instructional Films.
(C&P, M&S, C)	Base and Place. MP-So-BW-30 min. University of Colorado.
(T)	Basic Typing - Machine Operation. MP-So-BW-30 min. United World.
(BDP, EAM)	Beauty of It, The. FS-So-Col-30 min. Burroughs Corporation.
(T)	Better Typing at Your Fingertips. MP-So-Col-30 min. Modern Talking Picture Service.
(A, M&S)	Bookkeeping and Accounting. MP-So-BW-11 min. Carl F. Mahnke Productions.
(A)	Bookkeeping and Accounting Errors. FS-Si-BW. Business Education Films.
(A)	Bookkeeping and You. MP-So-Col/BW-11 min. Coronet Instructional Films.
(A)	Bookkeeping Cycle, The. *FS-Si. Society for Visual Education, Inc.*
(A)	Bookkeeping Series. 6 FS-Col. McGraw-Hill Book Co., Inc.
(E)	Build Your Vocabulary. MP-So-Col/BW-10 min. Coronet Instructional Films.
(T)	Building Typing Skills. MP-So-Col/BW-11 min. Coronet Instructional Films.
(A, E)	Business Education Series. 6 FS-Col. McGraw-Hill Book Co., Inc.
(PD, PS)	Business Etiquette Series. 11 FS-BW. McGraw-Hill Book Co., Inc.
(C&P, M&S)	By the Numbers. MP-So-Col-16 min. International Business Machines.
(BDP)	Careers in Business Data Processing. MP-So-Col-16 min. U. of Southern California.
(BDP, EAM)	Cards That Count, The. MP-So-Col-15 min. International Business Machines.

(BDP, C) Census '60. MP-So-BW-13 min. Univac Division of Sperry Rand.

(C&P) COBOL. FS-So-Col-20 min. Burroughs Corporation.

(M&S) Collection of Data. FS-So-Col-22 min. City College of New York.

(C&P, CO) Computer Programming. MP-So-BW-26 min. System Development Corporation.

(EAM) Control Input for ADP. FS-So-Col-27 min. Burroughs Corporation.

(A) Controlling Accounts. FS-Si. Business Education Films.

(EAM, BDP) Costs That Make Sense. MP-So-Col-15 min. International Business Machines.

(EAM, BDP) Data for Diagnosis. FS-Col-So-22 min. Burroughs Corporation.

(BDP) Data Processing for Hospitals. MP-So-Col-16 min. International Business Machines.

(BDP) Data Processing for the Wholesale Drug Industry. FS-So-Col. International Business Machines.

(C, BDP) 1620 Data Processing System. FS-So-Col. International Business Machines.

(C) Disks That Are a Cylinder. MP-So-Col-10 min. International Business Machines.

(BDP) Distribution Accounting. FS-So-Col. International Business Machines.

(T) Do You Know Your Typewriter? FS-Si. Society for Visual Education.

(M&S) Donald in Mathmagic Land. MP-So-Col-28 min. University of Michigan.

(C) Educated Computer, The. FS-So-Col. International Business Machines.

(T, E) Eight Parts of a Business Letter. MP-So-Col/BW-11 min. Business Education Films.

(T) Electric Typing Time. MP-So-Col-20 min. International Business Machines.

(BDP) Electronic Bank Bookkeeping on the Job. MP-So-Col-12 min. Burroughs Corporation.

(C&P, M&S) Electronic Computers and Applied Mathematics. MP-So-Col/BW-23 min. Colburn Film Distributors, Inc.

(C) Electronic Computers Improve Management Control. MP-So-Col-15 min. University of California.

(BDP)	F-2000 Computer. MP-So-Col-17½ min. Burroughs Corporation.
(BDP)	Filing Procedures in Business. MP-So-Col/BW-11 min. Coronet Instructional Films.
(BPD)	Fire and Casualty Agency Accounting. FS-So-Col. International Business Machines.
(C&P, BDP)	Flow Process Chart, The. MP-So-Col-15 min. City College of New York.
(BDP, C&P)	Flow Process Chart and How To Use It. MP-So-Col-15 min. University of Michigan.
(E)	Fundamentals of English Series. 6 FS-Si-Col. McGraw-Hill Book Co., Inc.
(M&S)	General Mathematics - Business Mathematics Course. 25 FS-Si-BW. (Teacher Manual) Educational Developmental Laboratories.
(E)	Grammar: Verbs and Ways We Use Them. MP-So-Col/BW-11 min. Coronet Instructional Films.
(T)	Gregg Typewriting Series. Set I and Set II. FS-So-12 min. per filmstrip. McGraw-Hill Book Co., Inc.
(BDP)	Hospital Accounting. FS-So-Col. International Business Machines.
(A)	How To Balance Accounts. FS-Si. Business Education Films.
(PD, PS)	How To Be Well Groomed. MP-So-Col/BW-10 min. Coronet Instructional Films.
(PD, PS)	How To Keep a Job. MP-11 min. Coronet Instructional Films.
(OS, PS)	Human Relations in Supervision. 24 FS-So-6 min. per filmstrip. McGraw-Hill Book Co., Inc.
(BDP, HSP)	IBM 1404 Printer, The. MP-So-BW-8 min. International Business Machines.
(BDP, C)	IBM 1410 Data Processing Systems. FS-So-Col. International Business Machines.
(BDP, C)	IBM 1428 Alphameric Optical Reader, The. MP-So-Col-11 min. International Business Machines.
(C, BDP)	Information Machine, The. MP-So-Col-10 min. International Business Machines.
(BDP)	Integrated Data Processing. MP-So-Col-35 min. Business Education Films.

(M&S, A)	Interest—60 Day 6% Method—Parts I and II. FS-Si. Business Education Films.
(A)	Introduction to Accounting. PS-Si. Business Education Films.
(C, BDP)	Introduction to Digital Computers. MP-So-Col-25 min. Univac Division of Sperry Rand.
(BDP, C)	Introduction to Feedback. MP-So-Col-11½ min. International Business Machines.
(A)	Journal—First Lesson, The. MP-Si. Business Education Films.
(T)	Know Your Typewriter. MP-So-Col/ BW-11 min. Coronet Instructional Films.
(E)	Look It Up! (Dictionary Habits). MP-So-Col/BW-11 min. Coronet Instructional Films.
(EAM, BDP)	Magic Window—Principles of Punched Card Accounting, The. FS-So-Col. International Business Machines.
(BDP)	Man-Machine Charts. MP-BW-22 min. State University of Iowa.
(PD)	Manner of Speaking, A. MP-So-BW/Col-28 min. Indiana Bell Telephone Company.
(A, M&S)	Meaning of Percentages. MP-So-Bw-10 min. Business Education Films
(BC)	Message to No One, A. MP-So-Col-25 min. Champion Paper and Fiber Co., Hamilton, Ohio
(BDP)	Methods Analysis. MP-So-BW-10 min. McGraw-Hill Book Co., Inc.
(OC)	Modern Business Machines. MP-So-20 min. Teaching Aids Exchange.
(C)	Moon Is Born, A. MP-So-Col-4 min. International Business Machines.
(EAM, BDP)	Next Step, The. MP-So-Col-15 min. International Business Machines.
(OR, PD)	Office Courtesy—Meeting the Public. MP-So-Col/BW-12 min. Encyclopaedia Britannica Films, Inc.
(PD, PS)	Office Etiquette. MP-So-15 min. Encyclopaedia Britannica Films, Inc.
(OS)	Office Supervisor's Problems. Six 8 min. films with Discussion Leader's Manual. MP-So-Col/BW. McGraw-Hill Book Co., Inc.
(OS, PS)	Office Supervisor's Problems Series, The. 6 MP-So-Col. McGraw-Hill Book Co., Inc.
(OR, PD)	Office Teamwork. MP-So-Col/BW-12 min. Encyclopaedia Britannica Films, Inc.

(C) 1418 Optical Character Reader. FS-Col. International Business Machines.

(A) Pay to the Order of. MP-So-10 min. Public Relations Council, American Bankers Association.

(A, M&S) Percents and Percentage Series. FS-So-Col/BW. Society for Visual Education, Inc.

(PD) Personal Qualities to Job Success. MP-So-11 min. Coronet Instructional Films.

(PD) Polish Up Your Personality. FS-Si. Society for Visual Education, Inc.

(A) Posting—One Journal, One Ledger. FS-Si. Business Education Films.

(C, BDP) Principles of Electronic Data Processing. FS-So-Col. International Business Machines.

(BDP) Process Charts. MP-So-BW-16 min. State University of Iowa.

(C) Program for Progress. MP-So-Col-16 min. Burroughs Corporation.

(C&P) Programming Languages. MP-So-Col-5 min. System Development Corporation.

(BDP) Public Utilities Accounting. FS-So-Col-14 min. Univac Division of Sperry Rand.

(BDP) Question Tree, The. MP-So-Col-13 min. International Business Machines.

(BDP, EAM) Retail Accounts Receivable. FS-So-Col. International Business Machines.

(BDP) Serving Through Better Systems. FS-So-Col-17 min. Burroughs Corporation.

(T) Shortcuts in Typing. MP-So-30 min. Educators Progress Service.

(BP&O) Sound Business. FS-So-BW. Continental Illinois National Bank and Trust Co.

(OS, PS) Supervisory Problems in the Office. 12 FS-So-8-11 min. per filmstrip. McGraw-Hill Book Co., Inc.

(BDP) Systems Analysis. FS-So-Col-13 min. Standard Register Company.

(BDP) Technology and You. MP-So-Col-13 min. University of Michigan.

(OC, M&S) Ten-Key Touch Training Course. 25 FS-Si-BW. (Operators and instructor manuals) Educational Developmental Laboratories.

(BDP, C) Then and Now. MP-So-Col-12 min. Univac Division of Sperry Rand.

(BDP, C) Thinking Machine, The. MP-So-BW-54 min. Association Films.

(C, BDP) "Thinking" Machines. MP-So-C-20 min. University of California.

(M&S) This Business of Numbers. FS-So-Col-20 min. Remington Rand Corporation.

(M&S, C&P) This Business of Numbers. FS-So-Col-20 min. Univac Division of Sperry Rand.

(T) Tips on Typing. MP-So-21 min. Underwood Corporation.

(T) Tricks of the Trade for Typists. MP-Si-15 min. Teaching Aids Exchange.

(EAM, BDP) Truck Route to Better Records. MP-So-BW-17 min. Univac Division of Sperry Rand.

(T) Typing-Keyboard Introduction Course. 2d. ed. 10 FS-Si-BW. (Student and teacher manuals) Educational Development Laboratories.

(T) Typing-Skill Development Course. 25 FS-Si-BW. (Student and teacher manuals) Educational Development Laboratories.

(C, BDP) UNA and the UNIVAC. FS-So-Col-16 min. Univac Division of Sperry Rand.

(BP&O) What Is a Corporation? MP-So-Col/BW-11 min. Coronet Instructional Films.

(BDP) What Is EDP? MP-So-Col-13 min. International Business Machines.

(E) Why Punctuate? MP-So-11 min. McGraw-Hill Book Co., Inc.

(E) Writing Better Business Letters. MP-So-Col/BW-10 min. Coronet Instructional Films.

(PD, PS) You're on the Team. MP-15 min. Eastman Kodak Company.

ADDITIONAL INSTRUCTIONAL MATERIALS

(BDP, I, C) Audio-Visual Aids. Data Processing Management Association. (Annual Catalog of Films in Data Processing.)

(E, BDP, I) Automation Dictionary (A Booklet) Philadelphia: Minneapolis-Honeywell Regulator Co., Industrial Division.

(A) Bookkeeping Procedure Visualized. (21 1/2" × 27 1/2" chart, B/W) National Blank Book Co.

(A) Bookkeeping Transparencies (8" × 10") for overhead projector. (Cincinnati: South-Western Publishing Co.) 1962.

(A) Bookkeeping Wall Charts. (48" × 52", 3 colors) George F. Cram Company, Inc.

(BDP) Careers in Data Processing. (A Booklet) Project on Information Processing. NSTA, Montclair State College, Upper Montclair, N.J.

(T) Cartoons. (8 1/4" × 10", for typing) National Association of Secondary School Principals.

(T) Cartoons. (8 1/2" × 11") Ohio Typewriter Service.

(A) Cartoons. (8" × 10", B/W for Bookkeeping) Special Teaching Aids.

(T) Case of the New, New Ribbon, The, (30" × 40" Poster, Col.) Poster Visual Aids.

(M&S) Facts for Math. (Teachers Ref.) Automobile Manufacturers Association.

(BDP) Filing Simplified. (17" × 22", Col.) Smead Manufacturing Co.

(T) Good Posture Charts. (11" × 17", Col.) Adjusto Equipment Co.

(T) Gregg Typing Picture-Posters—Letter Style Series. New York: McGraw-Hill Book Co., Inc.

(T) Gregg Typing Records—Keyboard Series. Boxes 1-4 inclusive. New York: McGraw-Hill Book Co., Inc.

(T) Keyboard Wall Chart. Education Research Committee.

(T) Keyboard Wall Chart. Royal Typewriter Co.

(T) Office Experience—Typewriters. (Demo. Kit, 40 mins.) Underwood Corporation.

(A) Social Security Charts. (Kit: 32" × 44" charts, teacher pamphlets) Bureau of Internal Revenue.

(PD) The Successful Secretary. (A Booklet) New York: Royal McBee Corp.

(T) Typewriter Keyboard Chart. (21 3/8" × 13") E. D. Crim Publications.

(T) Typewriter Keyboard Test. R.C. Allen Business Machines, Inc.

(T) Typewriter Kit No. 1. (Posters, Col.) Educational Supplies and Services.

(T) Typewriting Posture Posters. American Book Co.

(T) Typewriting Rhythm Records—Progressive Speed Series. New York: McGraw-Hill Book Co., Inc.

(T) Typing Cartoons. (8 1/2" × 11", Red and Black) Poster Visual Aids.

(T) Typing Habits, Ugh! (8" × 10"). Poster Visual Aids.

(T) Typingo. (Typing game) Russell W. Kraning.

(T) What Every Typist Should Know About Copies in Office Work. (Speed and Accuracy Tests) Ditto, Inc.

(A) Vu-Graph Bookkeeping Visual Aid Kit, The. (8 1/2" × 11" transparencies) Charles Beseler Co.

MATERIALS FROM DATA PROCESSING EQUIPMENT MANUFACTURERS

A variety of useful teaching materials may be obtained from local representatives of data processing equipment manufacturers. Some representative examples of available materials are listed in the Texts and Other Teaching Materials sections of the Elementary Library Systems and Classification and Coding units.

APPENDIX C — SOURCES OF EDUCATIONAL MATERIALS

Materials listed in this guide are obtainable from the following sources. Some of these sources may not have been referred to elsewhere, but all provide teaching materials of varying kinds.

Academic Press Inc., 111 Fifth Ave., New York, N.Y. 10003

Addison-Wesley Publishing Co., Inc., Reading, Mass. 01867

R. C. Allen Business Machines, Inc., 678 Front Ave., NW, Grand Rapids, Mich. 49404

Allyn and Bacon Inc., 150 Tremont St., Boston, Mass. 02111

American Bankers Association, 12 E. 36th St., New York, N.Y. 10016

American Book Company, 55 Fifth Ave., New York, N.Y. 10003

American Data Processing, Inc., 2200 Book Tower, Detroit, Mich. 48226

American Economic Foundation, 51 E. 42nd St., New York, N.Y. 10017

Arco Publishing Co., Inc., 480 Lexington Ave., New York, N.Y. 10017

Association Films, 347 Madison Ave., New York, N.Y. 10017

Automation Institute Publishing Co., 821 Market St., San Francisco, Calif. 94103

Automobile Manufacturers Association, 320 New Center Bldg., Detroit, Mich. 48202

Bailey Films, 6509 De Longpre Ave., Hollywood, Calif. 90028

A. S. Barnes and Co., 11 E. 36th St., New York, N.Y. 10016

Barnes & Noble Inc., 105 Fifth Ave., New York, N.Y. 10003

Charles Beseler & Company, 219 S. 18th St., East Orange, N.J. 07018

British Information Service, 30 Rockefeller Plaza, New York, N.Y. 10022

William C. Brown Co., Publishers, 135 S. Locust St., Dubuque, Iowa. 52002

Bureau of Internal Revenue, Department of the Treasury, Washington, D.C. 20220

Burroughs Corporation, 219 Park Ave. S., New York, N.Y. 10003

Business Education Films, 4607 16th Ave., Brooklyn, N.Y. 11204

Business Press, 288 Park Ave. W., Elmhurst, Ill. 60126

Business Teachers Guide, P.O. Box 114, Conway, N.H. 03818

Cambridge University Press, 32 E. 57th St., New York, N.Y. 10022

Carter's Ink Company, 80 Varick St., New York, N.Y. 10013

Castle Films, R.C.A. Building, 30 Rockefeller Plaza, New York, N.Y. 10020

Champion Paper and Fiber Co., Hamilton, Ohio. 45013

City College of New York, 17 Lexington Ave., New York, N.Y. 10010

Continental Illinois National Bank and Trust Co., 231 LaSalle St., Chicago, Ill. 60690

Coronet Instructional Films, 65 E. South Water St., Chicago, Ill. 60601

George F. Cram Company, 730 E. Washington St., Indianapolis, Ind. 46207

E. D. Crim Publications, 4271 Leimert Blvd., Los Angeles, Calif. 90008

Dartnell Corp., 4660 Ravenswood Ave,, Chicago, Ill. 60640

Data Processing Management Association, 524 Busse Hiway, Park Ridge, Ill. 60068

Department of Public Instruction, Commonwealth of Pennsylvania, Harrisburg, Pa. 17126

Ditto Inc., Harrison at Oakley Blvd., Chicago, Ill. 60612

Doubleday & Co., Inc., 575 Madison Ave., New York, N.Y. 10022

Education Research Committee, 777 14th St., NW., Washington, D.C. 20005

[illegible]

Educational Supplies and Services, 1650 N. Serrano Ave., Los Angeles, Calif. 90027

Educators Progress Service, Randolph, Wis. 53956

Encyclopaedia Britannica Films, Inc., 1150 Wilmette Ave., Wilmette, Ill. 60091

The Free Press, Glencoe, Ill. 60022

Funk & Wagnalls Co., 360 Lexington Ave., New York, N.Y. 10017

Garden City Books, Garden City, L.I., N.Y. 11535

Ginn & Company, Statler Office Bldg., Boston, Mass. 02117

Globe Book Company, 175 Fifth Ave., New York, N.Y. 10010

Grolier Co., 575 Lexington Ave., New York, N.Y. 10022

Grosset & Dunlap, 1107 Broadway, New York, N.Y. 10010

Harcourt, Brace and World, 757 Third Ave., New York, N.Y. 10017

Harper & Bros. See Harper & Row.

Harper & Row, Publishers, 49 E. 33rd St., New York, N.Y. 10016

D. C. Heath & Company, 285 Columbus Ave., Boston, Mass. 02116

Henry Holt and Co. See Holt, Rinehart and Winston, Inc.,

Holt, Rinehart and Winston, Inc., 383 Madison Ave., New York, N.Y. 10017

Horder's Inc., 231 S. Jefferson St., Chicago, Ill. 60606

Houghton Mifflin Co., 2 Park Street, Boston, Mass. 02108

Indiana Bell Telephone Co., 240 N. Meridian St., Indianapolis, Ind. 46204

International Business Machines Corp., 590 Madison Ave., New York, N.Y. 10022

Richard D. Irwin, Inc., 1818 Ridge Rd., Homewood, Ill. 60430

Karwood Comapny, P.O. Box 133, Milwaukee, Wis. 53213

R. W. Kraning, Indiana University, Gary Center, Gary, Ind. 46408

J. B. Kppincott Co., E. Washington Square, Philadelphia, Pa. 19105

Lyons and Carhahan, 2500 Prairie Ave., Chicago, Ill. 60616

Carl F. Mahnke Productions, 215 E. 3rd St., Des Moines, Iowa. 50309

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N.Y. 10036

David McKay Co., Inc., 119 W. 40th St., New York, N.Y. 10018

Macmillan Company, 60 Fifth Ave., New York, N.Y. 10011

G. & C. Merriam Co., 47 Federal St., Springfield, Mass. 01105

Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia, Pa. 19144

Modern Talking Picture Service, 3 E. 54th St., New York, N.Y. 10022

Monroe Calculating Machines Co., Educational Dept., Orange, N.J. 07051

Moore Business Forms, 210 Post St., San Francisco, Calif. 94108

National Association of Secondary School Principals, 1201 16th St., NW., Washington, D.C. 20006

National Blank Book Company, Holyoke, Mass. 01040

National Foreman's Institute Inc., Bureau of Business Practice, 100 Garfield Ave., New London, Conn. 06320

National Secretaries Association, 18 E. 60th St., New York, N.Y. 10022

Nation's Business, 1615 H St., NW., Washington, D.C. 20006

New York University Press, Press Building, 32 Washington Place, New York, N.Y. 10003

Ohio Typewriter Service, 3759 N. Berkeley, Cincinnati, Ohio. 45236

Oxford Filing Supply Co., Inc., Clinton Rd., Garden City, L.I., N.Y. 11535

Pitman Publishing Corp., 2 W. 45th St., New York, N.Y. 10036

Poster Visual Aids, 58 Union St., Milford, N.H. 03055

Prentice-Hall Inc., Englewood Cliffs, N.J. 07632

Remington Rand, Division of Sperry Rand Corp., 315 4th Ave., New York, N.Y. 10010

Republic Book Company, 115 E. 53rd St., New York, N.Y. 10022

John F. Rider, 116 W. 14th St., New York, N.Y. 10011

The Ronald Press Co., 15 E. 26th St., New York, N.Y. 10010

H. M. Rowe Company, 624 North Gilmor St., Baltimore, Md. 21217

Royal Typewriter Company, 2 Park Ave., New York, N.Y. 10016

Scott, Foresman, and Co., 433 E. Erie St., Chicago, Ill. 60611

Simon & Schuster, Inc., 630 Fifth Ave., New York, N.Y. 10020

L. W. Singer Co., Inc., 249-259 W. Erie Boulevard, Syracuse, N.Y. 13202

Smead Manufacturing Company, 309-311 2nd Ave., Hastings, Minn. 55033

Smith-Corona-Marchant Inc., 410 Park Ave., New York, N.Y. 10022

Society for Visual Education Inc., 1345 W. Diversey Parkway, Chicago, Ill. 60614

Sound Education, Box 414, Port Huron, Mich. 48061

Soundscriber Corp., 140 Munson St., New Haven, Conn. 06711

South-Western Publishing Co., Inc., 5101 Madison Rd., Cincinnati, Ohio. 45227

Special Teaching Aids, 3408 N. Potomac Street, Arlington, Va. 22213

Sperry-Rand Corporation, 1290 Avenue of the Americas, New York, N.Y. 10019

Standard Packaging Corp., Advertising Mgr., 200 E. 43nd St., New York, N.Y. 10017

Standard Register Company, 250 Park Ave., New York, N.Y. 10017

State University of Iowa, Ames, Iowa. 50012

Stenotype Company, 417 S. Dearborn St., Chicago, Ill. 60605

Sterling Publishing Company, 419 Park Ave., S., New York, N.Y. 10016

Superintendent of Documents, Government Printing Office, Washington, D.C. 20402

System Development Corporation, 350 Fifth Ave., New York, N.Y. 10001

Teaching Aids Exchange, 307 South B St., San Mateo, Calif. 94401

The Typing Teacher, 4006 Carlisle Ave., Baltimore, Md. 21216

Underwood Corporation, 1 Park Ave., New York, N.Y. 10016

United Business Schools Association, 1518 K St., NW., Washington, D.C. 20005

United World Films, Inc., 1445 Park Ave., New York, N.Y. 10029

University of California, Berkeley, Calif. 94720

University of Colorado, Boulder, Colo. 80302

University of Michigan, Ann Arbor, Mich. 48103

University of Southern California, Los Angeles, Calif. 90007

University Publishing Company, 1126 Que St., Lincoln, Nebr. 68501

D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N.J. 08541

Victor Adding Machine Co., Business Education Dept., Chicago, Ill. 60618

Wadsworth Publishing Co., 10 Davis Drive, Belmont, Calif. 94002

John Wiley & Sons, 440 Fourth Ave., New York, N.Y. 10016

Yale University Press, 206 Elm St., New Haven, Conn. 06711

Ziff-Davis. Now A. S. Barnes.

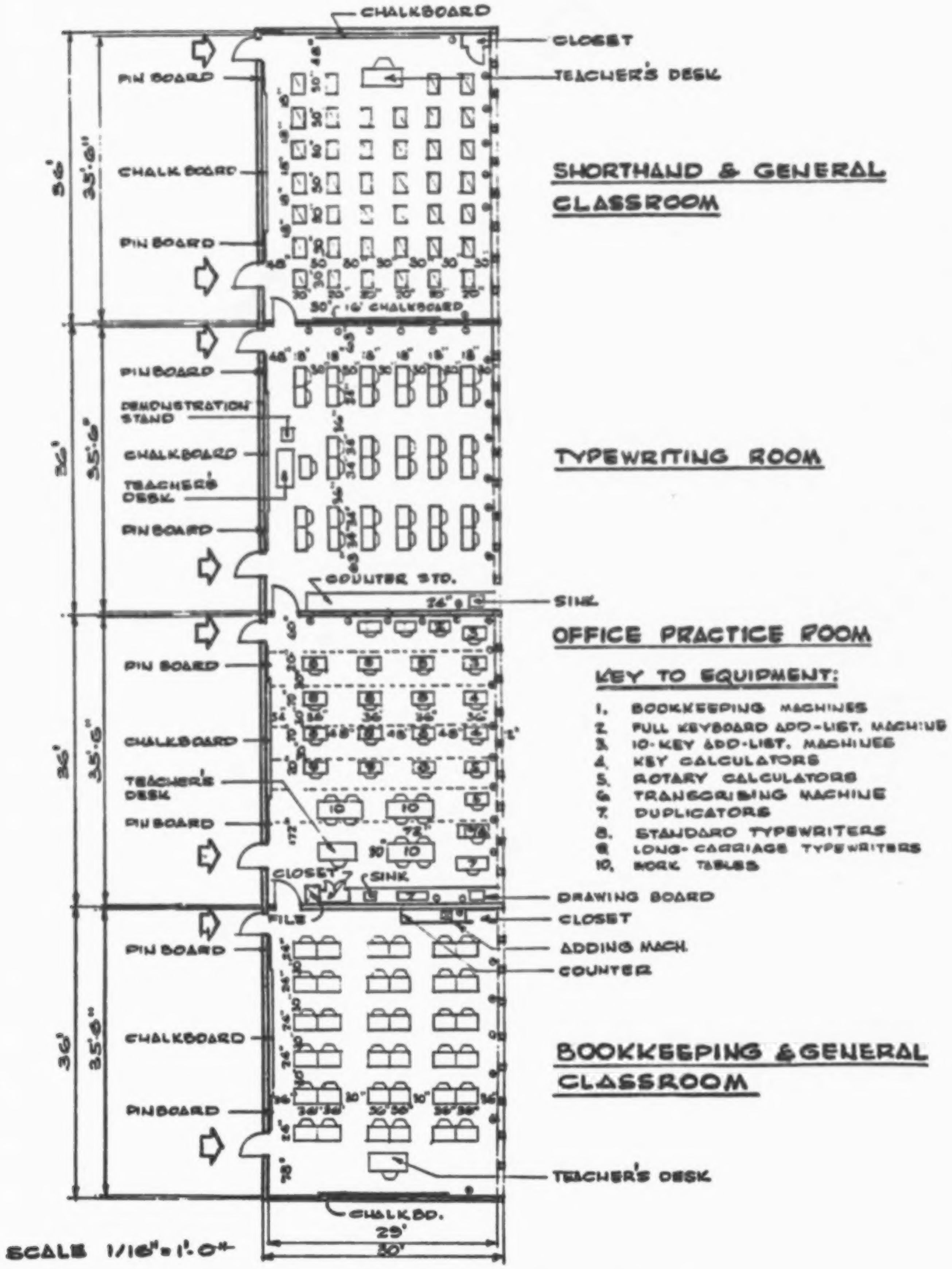
APPENDIX D – PHYSICAL FACILITIES LAYOUTS

TYPICAL FACILITIES LAYOUTS

Requirements for physical facilities cannot be estimated in advance for any particular location. These requirements will be affected by trainee populations, available instructional time and present facility adequacy.

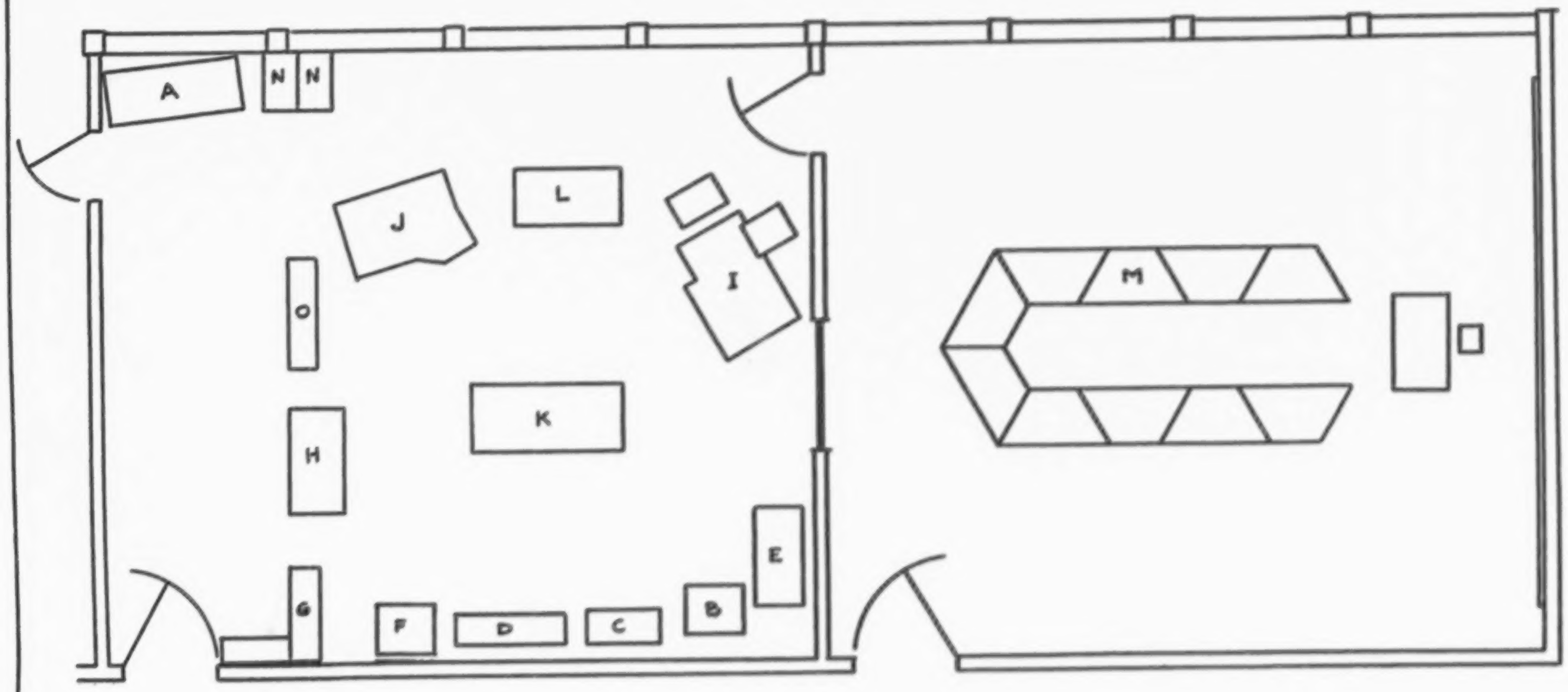
Two layouts are shown. One is reprinted by permission of the California State Department of Education from Bulletin No. 68. It is suggestive of a four-room layout of business education facilities. Should the number of trainees be greater or smaller, than these layouts can accommodate, then necessary adjustments are indicated.

FOUR ROOM UNIT


CHALKBOARD
CLOSET
TEACHER'S DESK
PIN BOARD
CHALK BOARD
PIN BOARD
36'
35'-6"
SHORTHAND & GENERAL CLASSROOM
30" - 16' CHALKBOARD
PIN BOARD
DEMONSTRATION STAND
CHALKBOARD
TEACHER'S DESK
PIN BOARD
36'
35'-6"
TYPEWRITING ROOM
COUNTER STD.
SINK
OFFICE PRACTICE ROOM
KEY TO EQUIPMENT:
1. BOOKKEEPING MACHINES
2. FULL KEYBOARD ADD-LIST. MACHINES
3. 10-KEY ADD-LIST. MACHINES
4. KEY CALCULATORS
5. ROTARY CALCULATORS
6. TRANSCRIBING MACHINE
7. DUPLICATORS
8. STANDARD TYPEWRITERS
9. LONG-CARRIAGE TYPEWRITERS
10. WORK TABLES
PIN BOARD
CHALKBOARD
TEACHER'S DESK
PIN BOARD
36'
35'-6"
CLOSET
SINK
DRAWING BOARD
CLOSET
ADDING MACH.
COUNTER
FILE
PIN BOARD
CHALKBOARD
PINBOARD
36'
35'-6"
BOOKKEEPING & GENERAL CLASSROOM
TEACHER'S DESK
CHALK BD.
29'
30'
SCALE 1/16" = 1'-0"

Courtesy of Bureau of Business Education, California State Department of Education and South-Western Publishing Co., Inc.

DATA PROCESSING LABORATORY LAYOUT



A. WIRING POSITION
B. VERIFIER
C. COLLATOR
D. SORTER
E. REPRODUCING PUNCH

F. CARD PUNCH
G. STORAGE CABINET
H. CARD FILES
I. ACCOUNTING MACHINE
J. COMPUTER

K. CONFERENCE TABLE
L. CARD READ AND PUNCH UNIT
M. STUDENT DESKS
N. CARD FILES
O. MASTER STORAGE LOCKER

NOTE: AIR CONDITIONING IS REQUIRED FOR THE LABORATORY

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